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Narrative of a Journey from Soobathoo to Shipke, in Chinese Tartary. By Lieut. A. GERARD, *Bengal Native Infantry, in* 1818.

From Soobathoo, in latitude 30° 58′ and longitude 77° 2′, situate about twenty miles from the plains, and 4,260 feet above the level of the sea, I marched to Mumleeg nine miles, three and a half miles from Soobathoo, crossed the Gumbur, an inconsiderable stream, but it had swollen so much from late rain, that its passage was effected with great difficulty. The road was a descent to the Gumbur, from which it slightly ascended.

22*d September*.—Marched to Simla thirteen and half miles. The road for the first eight and half miles was almost plain, then there was a steep ascent of one and half mile, and the last three were excellent, winding near the top of a range 7,000 feet high, and lying through a noble wood of many varieties of oak and pine.

23*d September*.—Marched to Bunee eleven miles. The road was level, leading amongst deep forests of pine, at the height of 8,000 and 9,000 feet above the sea. Thus far the path, which is practicable upon horseback, has been made by a company of Pioneers, for the facility of communication with the cantonment of Kotgoor, thirty-four miles further to the north-east.

24*th September*.—Marched to Pulana ten miles. Left the made-road six miles from last camp, and descended by an indifferent and slippery footpath to the village, which belongs to the Rana of Theog.

25*th September*.—Marched to the Kotkhaee eleven miles. The road lay along the bank of the Giree, one of the branches of the Jumna, and was often rocky and dangerous, the footpath being frequently overgrown with grass, and seldom half a foot in breadth.

Kotkhaee is the residence of the Kotgoor Rana, a hill chief under the protection of the British Government. It is situate on a most romantic spot, upon the point below which, two streams unite to form the Giree; on one side the rock is 182 feet perpendicular, and on the other there is a long flight of stone steps; neither of the streams, which are only twenty feet broad, are fordable, so by destroying the bridges, the place might be well defended against musketry. The Rana's residence is three stories high, and has a most imposing appearance; each story projects beyond the one beneath, and the top is crowned by a couple of handsome Chinese turrets, beautifully adorned with finely carved wooden work.

26*th September*.—Marched to Gujyndee eight miles. The road at first lay up the bed of one of the branches of the Giree, and there was a very steep and tiresome ascent of 2,400 feet to Deouree Pass, 8,885 feet high, from whence there was a descent to camp.

Gujyndee is in Nawur, a small district of Busahir, famed for its numerous iron mines; there are few spots here fit for cultivation, and the inhabitants, who are miners, live chiefly by their trade in iron. They work the mines only about three months in the year, and commence digging them in March, after the snow has sufficiently melted; at other times, they say, the earth falls in, and it is unsafe to work.

27*th September*.—Proceeded to Rooroo, a fatiguing march of thirteen miles, crossing a high range of mountains. Here we first came upon the Pabur, one of the feeders of the Tonse, which falls into the Jumna, and is a stream of considerable size. Barometrical observations give the extreme height of its bed 5,100 feet.

Rooroo is situate in Choara, one of the large divisions of Busahir, and the most populous and best cultivated spot I have seen in the hills; the dell is broad, and the ground is well adapted for rice fields, being watered by many canals cut from the river which winds through it.

Three marches more, or twenty-six miles, brought me to Jangleeg, the last and highest village in the valley of the Pabur, elevated 9,200 feet above the sea. The road latterly was extremely rugged and dan-

gerous, at one time many hundred feet above the river, with a horrid precipice on the right, at another dipping down to the stream which rushes with violence over the rocks interspersed in its channel; as you advance, the dell in which the Pabur flows becomes gradually more contracted, the mountains assume a more naked and abrupt appearance, and the rapidity and turbulence of the river increases. From Jangleeg proceeded ten miles to a halting place called Moondoor, within two miles of the Brooang Pass over the great snowy range. The road was good, and lay in a broad grassy glen, between two spurs of the Himalayas, with the Pabur running through it. The soil of this valley is composed of black vegetable mould, which produces endless varieties of Alpine plants to the height of 13,000 feet. Belts of birch and pine reach nearly the same elevation, beyond which, scarcely any thing is seen but patches of brown grass.

The height of my camp, which was pitched beneath an immense projecting granitic rock, was 12,807 feet. We left the last cluster of birch trees 3 miles behind us, so had to send back that distance for firewood. The thermometer was 38° at night, and water froze hard.

Next day, 2*d October*, we pitched our tent on the crest of the pass, 15,095 feet above the level of the sea; the road was of the worst description, crossing the Pabur, which has its source near this, by an arch of snow of some extent, and then leading over huge detached masses of granite, hurled from the peaks above, and piled upon one another in the utmost disorder, with here and there some snow. The ascent was steep the whole way, and almost the only vegetation we noticed was grass in small tufts, which grew more scanty as we advanced to the pass, where it almost disappeared; above it was still seen thinly scattered, and interspersed with a few mosses.

Here I met my brother, who had left Soobathoo some time before me and travelled by a much more circuitous route.

We sent most of our servants down about five miles to a more genial climate, where wood was procurable, and remained ourselves at the top. The peaks immediately on either side of us were not more than 1,000 feet above us, but there were several not very far distant, which we could not then see, 18,000 feet high. We were lucky in getting the altitudes and bearings of the principal mountains across the Sutlej, which rear their white heads to the height of 20,000 feet and upwards.

The thermometer in a tent got up so high as 50° during the day, but at 4 P. M. it fell to the freezing point, and at 7 P. M. was 8° below it. We sat up till past 10 for the purpose of making astronomical observations, which in such a temperature was rather an uncomfortable occupation; our situation indeed in other respects was none of the most agreeable, we had but a scanty supply of firewood, which when kindled in the middle of the tent involved us in smoke, and we were somewhat incommoded by having to share our accommodation, such as it was, with our servants, whilst every now and then we were alarmed by the crash of rocks split asunder by the frost.

We had all severe headaches during the night, owing probably to the rarefaction of the air, but attributed by the natives to a poisonous plant said to grow most abundantly at the greatest elevations.

This pass is situate in latitude 31° 23′ and longitude 78° 12′, it separates Choara from Koonawur, another of the grand divisions of Busahir, which lies on both banks of the Sutlej, extending from latitude 31° 30′ to 32°, and from longitude 77° 53′ to 78° 46′. It is a secluded, rugged and barren country, seldom exceeding eight miles in breadth. It is terminated on the north and N. W. by a lofty chain of mountains covered with perpetual snow, upwards of 20,000 feet high, which separates it from Ludak; a similar range of the Himalayas bound it to the southward; on the east a pass almost 14,000 feet high divides it from Chinese Tartary; and on the west lies another of the principal divisions of Busahir.

The villages, which are elevated from 8,000 to 12,000 feet above the sea, are very thinly scattered, not more than two or three occur in a stage, and sometimes none at all for several days. In the summer season, from the reverberation of the solar rays, the heat in the bed of the Sutlej, and other large streams is oppressive, and quite sufficient to bring to maturity grapes of a delicious flavour, of which raisins and a spiritous liquor called *Rakh* are made. The inhabitants wear a frock of white blanket, often two-fold, reaching down to the knees, and having sleeves, a pair of trowsers and girdle of the same, a cap of black blanket like a bonnet, and shoes of which the upper part is woollen, and the sole alone leather. The people are very dark and extremely dirty, but they seem to enjoy a much greater degree of comfort in their habitations than any of the other mountaineers we have seen. The villages

are generally large, and the houses spacious and even elegant; they are built of stone and wood, and either slated or flat roofed, the last is most common. The temples of the *Deotas* (deities) are magnificent, and adorned with a profusion of ornaments. There are two or three in almost every village, and sundry miraculous feats are ascribed to the gods to whom they are dedicated, scarcely one of whom but has the credit of having removed some mountain or vast rock for the purpose of rendering the roads passable, or of some other like achievement.

The level spaces of land in Koonawur are few, the crops are extremely poor, and a want of grain pervades the whole country. In time of scarcity, small pears and horse chesnuts, after being steeped in water to take away their bitterness, are dried and ground into flour. There are, however, no marks of poverty, and the natives subsist by exchanging raisins and wool for grain; they have little else to do but look after their vineyards, and attend to their flocks, which in summer are sent to pasturage at some distance from the villages. Bears are very numerous, and commit great ravages; in the grape season, during the whole night, several people from each village together with their dogs, are employed in driving them off.

The dogs are of a large ferocious breed, covered with wool and extremely adverse to strangers, whom they often bite and tear in a most shocking manner; they are commonly chained during the day, otherwise it would be dangerous to approach a village. The winter is rigorous, and for three months there is no moving out of the villages owing to the quantity of snow; during this season the inhabitants employ themselves in weaving blankets. They early begin to collect their winter stock of fuel and food for their cattle, which latter consists chiefly of the leaves of trees, and they pile it upon the tops of their houses.

The Koonawur language, of which we made a collection of nearly 1,000 words, differs much from the Hindee, most of the substantives ending in — *ing* and *ung*, and the verbs in — *mig* and *nig*.*

3*rd October*.—The thermometer was fifteen degrees below the freezing point and the cold intolerable, we therefore waited till two hours after sunrise, and then proceeded to the village of Brooang, distant eight and a half miles; the road lay over a thick snow bed for the

* This vocabulary has fortunately been preserved, and will shortly appear.—Ed.

first mile, and then led through extensive woods of various sorts of trees, amongst which we recognised the hazel, plane, horse chesnut, and many other European plants. The way was often rugged, and a steep descent of 7,600 feet perpendicular height. On the road we found black currants and raspberries in the greatest perfection, of which we preserved a large quantity, and on our arrival at camp we feasted on grapes. Brooang is a small village in Tookpa, one of the subdivisions of Koonawur, under the Wuzeer Teekumdas. It is situate near the Buspa river, and about two miles from the left bank of the Sutlej.

4*th October*.—Marched to Pooaree, a distance of twelve and a half miles. The road was extremely bad, lying often upon the face of a naked stone inclined to the horizon at a considerable angle, with a precipice of many hundred feet on the outer side; it was no great ascent or descent, but so much caution was necessary to prevent the traveller from slipping off the rocks into the river Sutlej, which lay close upon our left, that the journey took us up twelve hours. To-day we crossed the Buspa, a large stream forty two feet broad, whose source is amongst snow, five or six marches S. E. of Brooang.

5*th October*.—Proceeded to Rispè, a march of thirteen and half miles, likewise occupying us the whole day. The road which lay through thin forests of pine was not so dangerous as yesterday's, but consisted of several steep ascents and descents upon rocks of crumbling granite of 2,000 feet each. We had a grand view of the Kylas or Ruldung mountains from the large town of Reedung or Ribe, three and half miles before we reached camp; some idea of it may be formed by imagining an assemblage of pointed peaks presenting a vast surface of snow, viewed under an angle of twenty-seven degrees, and at a distance of not more than five miles in a direct line. The height of our station was 8,000 feet, and the Kylas peaks were 12,000 higher.

At Rispè we first saw Lamas, and near this place we passed several tumuli from ten to forty feet in length, two broad, and about four high, they are constructed of loose stones without cement, and upon their tops are numerous pieces of slate of all shapes and sizes carved with strange characters, they are called manè, like the *manes* αἱ ψυχαὶ τῶν νεκρῶν, or souls of the defunct, see verq. 3. Æ. n. v. 303. and are erected over the graves of the Lamas. There are invariably roads on each side of them, and the natives, from some superstitious custom, always leave

them on the right hand, and will rather make a circuit of half a mile than pass them on the wrong side.

6th October.—Marched to Murung five miles. The road was pretty good along the left bank of the Sutluj, crossing a river named Teedoong, whose source is in the Chinese dominions four day's journey to the eastward.

Murung is a Lama town of considerable size, consisting of seven or eight distinct divisions, and beautifully situated chiefly upon a southern exposure, in a glen which forms the greater part of an ellipse, through it runs a transparent stream, upon the banks of which are extensive vineyards and orchards, abundantly supplied with water by numerous rills. The dell is encircled by lofty mountains at an angle of twenty-five degrees on every side, except on the westward, where it is open towards the Sutlej, on the bank of which there is a small fort. The situation is extremely fine, and the approach to it highly picturesque, leading along the bank of a canal, and through an avenue of apricot trees. Near this place there are a great many piles of stones with inscriptions, and afterwards we met with them almost at every village, until we reached Pangee, on our return where they end. We also saw a number of temples called Chosten, which are likewise to be found in the vicinity of every Lama habitation; they consist of an enclosure formed of three walls with a roof and open in front, in the inside of them are one or more small white-washed buildings shaped like urns.

It was our intention to have proceeded further, but the people told us the next village was at such a distance, and the ascent so fatiguing, with no water on the way, that we could not possibly reach it that night.

7th October.—Marched to Nisung eight miles. The road commenced with a very tiresome ascent of 5,300 feet perpendicular height; here we were delighted to find numerous beds of juniper and some gooseberries, which were the first we had seen for a long period of years; we were in great hopes we should have met with heath, but saw none. At the top of Toongrung Pass, 13,739 feet high, it began to snow, and the thermometer was below the freezing point, so we were glad to make the best of our way down; the foot-path was good, but a steep descent through juniper and thyme of many kinds to Nisung, a small Lama village situate near the Taglak'har, a large stream which rises in Chinese Tartary three or four marches to the eastward. The extreme height of

this village by corresponding barometrical observations is 10,165 feet, and grapes do not ripen here. There are many gardens of fine large turnips belonging to the village, fenced around with hedges of gooseberries; the latter are of the red sort, small and extremely acid, but make a capital tart.

8*th October*.—We were delayed till 2 P. M., in order to get grain ground for the consumption of our people, there being no village at the next stage. We marched only one and three-quarter mile, and the road at first was a descent to the Taglak'har, and then a steep ascent of 2,000 feet, most part of the way up a slope of forty degrees, and over rugged rocks. We were obliged to halt here, there being no water for many miles in advance.

9*th October*.—Marched ten miles to the bed of a mountain torrent, and did not arrive till an hour after dark. This day's journey was one of the most tiresome we had experienced, crossing two mountains of 12,000 and 13,000 feet, the ascents and descents, one of which was full 4,000 feet in perpendicular height, were steeper for a longer continuance than any we had yet seen, and the path was strewed with broken slate, which gave way under the feet. Neither tent nor baggage arrived, and we had nothing to eat but cakes of very coarse meal, which hunger however made palatable; upon this kind of food, together with a few partridges which our people occasionally shot, and without either plates and knives or forks, we lived for five days. We should have afforded an amusing spectacle, seated upon blankets near a fire in the open air, surrounded by our servants, dissecting the partridges with the *kookree*, or short sword worn by the Goorkhalees, and smoking plain tobacco out of a pipe little better than what is used by the lowest classes. Novelty however has its charms, and our being in a country hitherto untrodden by an European, gave us a delight amidst our most toilsome marches, scarcely to be imagined by a person who has never been in the same situation.

10*th October*.—Marched to Dabling six and three-quarter miles. The road was pretty good, lying near the river. We went a mile out of the direct way, to visit the Namptoo Sango, a wooden bridge across the Sutlej. The river was here 106 feet broad, with large rocks in its bed, and the bridge seventy-eight feet above the stream, which rushes with rapid violence between blocks of granite. We in vain tried to measure its

depth, and although we had a heaving lead for the purpose, of no less than ten pounds weight, we could not effect it, for the force of the current was so great as to sweep it down long ere it reached the bottom. We found the bed of the river 8,200 feet above the sea.

11*th October*.—Marched to Numgeea nine miles. The footpath was good and even, lying upon the left bank of the Sutlej. To-day we made a circuit to look at the conflux of the Lee with the Sutlej. The Lee is a river of considerable breadth, coming from Ludak on the northward, but it is not very deep, and flows in a clear stream with a moderate current, whilst the Sutlej is muddy, and rushes with great velocity and a stunning noise.

Since leaving Pooaree, the trees had gradually become more scanty; in the vicinity of Numgeea there is little vegetation, grass and thyme are but thinly scattered in small tufts, and a solitary dwarf pine appears here and there.

12*th October*.—Marched to Shipkè nine miles. The road ascended a little, and then there was a steep descent into the bed of the Oopsung. Here the rocks are more rugged than any we had yet seen, they are rent in every direction, piled upon one another in wild disorder, in a most extraordinary manner not to be described, overhanging the path, and threatening destruction to the traveller. From the Oopsung, the road was a tiresome and rocky ascent to the pass which separates Koonawur from the Chinese dominions, 13,518 feet above the level of the sea; here the scene was entirely changed, a more marked difference can scarcely exist. The mountains to the eastward were quite of another nature from those we before met with, they are of granite broken into gravel, forming regular slopes, and neither abrupt nor rocky. The country in that direction has a most desolate and dreary aspect, not a single tree or blade of green grass was distinguishable for near 30 miles, the ground being covered with a very prickly plant, which greatly resembled furze in its withered state; this shrub was almost black, seeming as if burnt, and the leaves were so much parched from the arid wind of Tartary, that they might be ground to powder by rubbing them between the hands.

The brownish tint of the furze, together with the bleakness of the country, have the appearance of an extensive heath, and would strongly remind a Scotch Highlander of his native land. Our course from

Brooang was about N. E., here we found we had reached the northern point of the Sutlej in latitude 31° 50′, it lay about two miles upon our left hand, and from this place its direction all the way to its source in the celebrated lake of Mansurowur is nearly E. S. E.

The wind was so strong, that we could with difficulty keep our feet, and it is said to blow with almost equal violence throughout the year. We saw some snow on our right a little below us, and beyond it a peak above 20,000 feet high, off which the snow was drifting in showers, from the force of the wind. From the pass to camp, the road was a moderate descent upon gravel, winding very much.

Shipkè is a large village in the district of Rongzhoong, under the Deba or Governor of Chubrung, a town, or rather collection of tents on the left bank of the Sutlej, eight marches to the eastward. The houses here are very much scattered, and are built of stone with flat roofs, there are gardens before each hedged with gooseberries, which give them a neat appearance. This is a populous place; we counted upwards of eighty men, who on our arrival came to meet us, being the first Europeans they had ever seen.

The Tartars pleased us much; they have none of that ferocity of character so commonly ascribed to them; they have something of the Chinese features, and their eyes are small; they go bare-headed even in the coldest weather, and have their hair plaited into a number of folds ending in a tail two or three feet long. Their dress consists of a garment of blanket, trowsers of striped woollen stuff resembling Tartan, and stockings or boots of red blanket, to which are sewed leather shoes; most wear necklaces, upon which are strung pieces of quartz or bone; they have also knives in brass or silver cases, and all carry iron pipes of the same shape as those used by labourers at home, and the higher classes have them ornamented with silver; in common with the inhabitants of Koonawur, the greater part of them have a flint and piece of steel for striking fire, attached to their apparel by a metal chain. The women whose dress resembles that of the men, were literally groaning under a load of ornaments, which are mostly of iron or brass, inlaid with silver or tin, and beads round their necks, wrists, and ankles, and affixed to almost every part of their clothes.

13*th October*.—Halted. My brother took a walk of about a mile farther on, with the perambulator and pocket compass, for we did not think it

advisable to use the theodolite in the presence of the inhabitants, knowing their extreme jealousy; he had proceeded a little way from the village before he was perceived, when immediately the people dispatched a couple of horsemen after him, and crowded round the tent, making a great uproar. My brother had begun to return before the horsemen overtook him; they told him they had come to bring him back, but seemed in perfect good humour, laughing whilst they spoke; they insisted upon his going before them, and would not dismount when he bid them.

About 9 o'clock, the Chinese Officers, of whom there are several to regulate the affairs of the country, brought sixteen seers of flour, which they requested us to receive as a present, and it was no unacceptable one, for our people had had but little food for the last three days. In the forenoon, the principal Officer shewed us a long piece of parchment, written in what we supposed the Chinese character, and gave us to understand it was an express order from the Garpan of Garoo, under whose authority the Debas are, prohibiting strangers from entering the country; he at the same time said, we had so many people with us, (having nearly 100,) that he could not oppose our progress, but it would cost him his head if he gave us the means of going on, so he would not supply us with provisions, which was the most effectual mode he could have adopted to stop us.

During the time we were at Shipkè it blew a complete hurricane, and the aridity of the wind dried up every thing exposed to it; the leaves of our books were more bent than I ever remember to have seen them in the hot winds, and no dew was observed.

The lat. of Shipkè by meridian altitudes of stars is 31° 48′, and the long. 78° 48′, its extreme height is 10,527 feet, and the thermometer ranged from 38° to 60°.

The people are affable and good natured, and allowed us to handle their pipes, knives, &c.; they thronged round our tent from morning till night, and we found it the most difficult thing to understand them even with the aid of interpreters, for the Koonawur words we had picked up, which were of the utmost use to us during our tour, were not intelligible here. This evening the articles that had been so long in the rear came up.

14*th October*.—At sunrise, when the thermometer was 31°, and before the inhabitants had risen, I set up the theodolite and took the bearings

and altitudes of the remarkable peaks; one of them covered with snow above 20,000 feet in height, is only 4 miles from the village from which it subtends an angle of 28 degrees; another called Tuzheegunj, 22, 488 feet high to the north of the Sutlej, was seen under an angle of 23° 31′, these elevations were observed with the sextant and artificial horizon.

We exchanged a gold button for a goat, which we took with us to Soobathoo; the wool is extremely fine, and almost equal to what is used for the manufacture of shawls; we were informed the best was procured further to the eastward near Garoo, which is the famous mart for wool. The goat scarcely differs from the common one, and it does not appear to be a distinct breed that produced the shawl wool, but its fineness seems to depend almost entirely upon the elevation and coldness of the climate. We ourselves had an opportunity of seeing this at Soobathoo, 4,200 feet above the sea, the wool is little better than in the plains of Hindoostan, but it gradually grows finer as you ascend, and in Koonawur, where the villages are more than 8,000 feet high, it is fit for making coarse shawls.

Garoo or Gartop, by the accounts of fifteen different people, is reckoned 11 marches from Shipkè, and the road consisting of gentle swellings, is described as being so good, that the trade is carried on by yaks.

After breakfast, we returned to Numgeea by the same road as before, and on the 15th of October struck off to the N. W. towards Ludak, crossing the Sutlej a mile from the village by a crazy bridge, constructed of ropes made of the bark of a tree, with basket-work of twigs forming a curve almost the sixth part of a circle. The breadth of the river was 74 feet, including a large rock in the middle occupying 42 feet, the extreme height of the bed is 8,600 feet. This day we travelled 7½ miles, passing over a mountain of 13,186 feet, the ascent of which was very steep upon rugged rocks, and above 4,500 feet. We encamped near a stream at the height of 12,800 feet, and had but a small supply of fire-wood, the country producing nothing but the prickly bush before-mentioned, and another not unlike broom.

16*th October*.—Seeing high mountains to the eastward, which appeared to be practicable, and thinking the distance short, we resolved to attempt them whilst our baggage proceeded direct to Mako, only about 3 miles from our camp. We accordingly set off after an early break-

fast, and went up the face of a steep hill for $1\frac{1}{2}$ mile, sometimes over large misshapen masses of granite, sometimes upon a gravelly soil covered with brown furze and various kinds of aromatic shrubs. There was not the least trace of a foot-path, and the prickly bushes impeded us not a little, every moment running into the feet through the shoes which were of the kind used by the natives, our own stock, from the badness of the roads, having been long since worn out. The height of this station was 14,900 feet. There being another higher peak without snow that seemed near, we moved towards it, but were never so much deceived in distance, it took us full three hours to reach its top, and the ascent was very tiresome, lying over enormous detached blocks of stone, often resting upon small bases, tottering under the feet, and seeming ready to overwhelm us; the last 200 yards were still worse, and we were obliged to use both hands and feet, now climbing up almost perpendicular rocks, and now leaping from one to the other; a single false step might have been attended with fatal consequences, and we had such severe headaches, and were so much exhausted, that we had hardly strength sufficient to make the effort, and it required no inconsiderable one to clear the deep chasms which we could scarcely view without shuddering. I never saw such a horrid looking place, it seemed the wreck of some towering peak burst asunder by severe frost. After much delay, we got up the theodolite and a couple of barometers, at 4 P.M. the mercury stood at 16.170 inches, and the thermometer was 29°, which compared with corresponding observations made at Soobathoo, gives the height 16,921 feet. We observed all the surrounding peaks, and then proceeded to the village of Nako at a quick pace, the road for the first mile was a steep and rocky descent, afterwards a more gradual one to camp, where we arrived at dusk. The distance by perambulator was ten and half miles, but we must have travelled upwards of eleven, for the wheel could not be rolled to the top of the highest peak.

17*th October*.—From what we saw yesterday, we were convinced we could reach a more elevated spot, and thinking the attainment of a great height more desirable than a high latitude, we resolved to try it again, and rather defer our intended journey towards Ludak, than let slip such a favourable opportunity. From our experience of the slowness with which the perambulator can be rolled over the large

stones, we sent it together with the large theodolite a-head at 8, and moved ourselves at 10. The road at first was tolerably good, lying upon turf and passing some lakes which were frozen over, latterly it was rocky and the ascent fatiguing, but not near so difficult as yesterday's. We stopped several times to look out for our people, but not seeing any sign of them, we dispatched a man to Nako with orders to bring our bed clothes, a few bundles of fire-wood, and some food to meet us, whilst we proceeded on to a kind of break between two peaks. The last half mile was generally over snow, and both my brother and I felt completely debilitated, and were affected with severe headaches and pains in the ears; the highest vegetation we saw was a plant with leaves like sage, but without smell, it grows at the height of 17,000 feet, beyond which elevation we found no soil. At the top of our station between the peaks, the barometer shewed 15.075 inches, which gives the height 18,683 feet. The thermometer when first taken out of the case was 30°, but in less than a quarter of an hour, it fell to twenty-two degrees below the freezing point. After taking a few bearings, with all possible haste, we set out on our return, and at dark met our servants with our bed clothes $1\frac{1}{2}$ mile from Nako, and halted for the night at the height of 13,724 feet without a tent. Our people had brought wood, but not flint to strike a light, we therefore sent them back to the village for some fire. It was past 11 before they returned, and during an interval of near 5 hours, we sat shivering with cold, for the thermometer was 6° below the freezing point, and we had only a couple of blankets each to wrap round us. After we had lighted a fire, we made a large quantity of punch, which we continued drinking till near two in the morning, and I do not recollect any thing that ever refreshed me so much.

The length of our march to-day was about ten miles, and we ascended 6,800, and descended 5,000 feet perpendicular height. The people with the perambulator and theodolite missed the way, and did not arrive till midnight, and their hands and feet were almost frozen.

18*th October*.—The thermometer at sunrise was 16°, and the cold intense, we could not sleep much owing to it, for excepting a few sticks which we kept for the purpose of preparing breakfast, our firewood was exhausted.

We wished much to see the barometer below fifteen inches, and determined to make another attempt to reach the summit of a peak north

of our yesterday's station, which appeared 600 or 700 feet higher. Being now one and a half miles nearer to it than before, we had every hope of succeeding, so sent off the articles we required there as soon as we could prevail upon our people to move, which was not, however, before 9 o'clock. We were well equipped with instruments for making all requisite observations; we took three barometers, two thermometers, a large theodolite and a small one, a perambulator, a telescope magnifying eighty times, and a smaller one, together with a bundle of sticks to try the boiling water, and a sextant and artificial horizon, with us. We marched a little after ten, and overtook our people not a mile from our halting place; we had infinite trouble in getting them to go on, and were obliged to keep calling out to them the whole way, at one time threatening, and at another coaxing them; to tell the truth, however, we could not have walked much faster ourselves, for we felt a fulness in the head, and experienced a general debility, which together with headaches and pains in the ears and breast, affected us more than the day before. A cold wind that benumbed our hands sprung up, and increased with our height till about 3 P. M., when it died away. After much annoyance, we reached the place where we put up the barometer yesterday, here the man who carried the bundle of sticks sat down and said he must die, as he could not proceed a step further, and neither threats nor the promise of a handsome reward could induce him to move; we accordingly left him, and after an ascent of 700 feet, attained the top of the peak, 19,411 feet above the level of the sea. The road latterly lay over disunited blocks of granite, between which we found large lumps of ice transparent as crystal; we got up the last ascent without much difficulty, which is somewhat surprising. It was 4 P. M. when we gained the summit, so we had no time to make half of the observations we wished; the thermometer was not below twenty-two degrees, but from the wind on the way up, our hands were so numbed, that it was not until we had rubbed them for sometime that we got the use of them. Whilst I was setting up the large theodolite, my brother tried three excellent barometers, which we had the satisfaction to see stand exactly at the same point, 14,675 inches. The Turheegung mountain had an elevation of seventeen degrees, and was not more than two miles distant; the ink froze, and I had only a broken pencil with which I got on very slowly. It was twenty minutes to five before

we had finished our observations, the thermometer was eleven degrees below the freezing point, the cold increasing every instant, and we had 7,600 feet to descend, over a bad road, in a distance of six miles. We cautioned our people against delay, and moved downwards as fast as we could walk; we passed the bundle of sticks where it was left, but the man had disappeared, and we next day understood he had reached camp before us. Night overtook us two and half miles from Nako, and my brother had the misfortune to fall and hurt his leg so much, that we greatly feared he would be obliged to remain where he was until assistance could be obtained from the village; after sitting down for half an hour, he found himself able to proceed at a slow pace, so we moved on, and shortly after lost the road by going too far to the right. We got in amongst a confused jumble of gigantic masses of rock, from which we found it no easy matter to extricate ourselves; we wandered about amidst them almost as chance directed for one and half-hours, many of the stones shook under us, and we passed places frightful even in daylight. About nine we espied a light below us, and heard the roaring of the Lee river, which seemed quite close; it being then calm, this made us imagine we had gone beyond the village, but judging from the strange structure of the surrounding mountains which we could scarcely mistake, we thought it impossible we could have done so, more especially as we had seen no cultivation, and there are a good many fields around Nako; we therefore went on and arrived at a Lama's temple that we recognised about a quarter of a mile from camp; we called out, and were answered by some of our people, who came to meet us with a couple of lights. We reached camp at half-past nine, not so much tired as might have been expected; only four of our servants arrived that night, the rest stopped without firewood at our former halting place, and came up late next day, having their feet so much swollen by the frost, as to be unable to carry loads during the rest of our journey. The distance to-day was ten and a half miles. Our last three marches were fraught with accidents; three barometers, a perambulator, and thermometer were smashed in pieces, and the small theodolite, a very neat instrument by Dolland, was rendered unfit for taking elevations, the nonius having been broken off; we had remaining two theodolites, a surveying compass, four barometers, and as many thermometers, a strong perambulator, a couple of sextants, a reflecting circle, a repeating

one, and a chronometer, so we were still very well supplied with instruments.

We had great reason to be thankful, that during these last three days there was very little wind, and none at all when we visited the highest peaks, for had there been any when the thermometer was so low, it must have chilled us, so that we could not have moved, and to have remained at such heights for a night, would have been almost certain death.

19*th October*.—As many of our servants were unable to walk, from fatigue and sore feet, we halted. The village of Nako is situate about a mile to the east of the Lee river, and is the highest we met with during our tour, being not less than 11,850 feet above the sea; it is pretty large, and inhabited by Lama Tartars, rather different in appearance from those at Shipkè, and not so much resembling the Chinese; there is more cultivation about it than would be expected considering its elevation, the fields which are chiefly wheat and a kind of pulse, extend to the height of 13,000 feet, and have stone dykes around them; yaks are used here in the plough, they are hardy animals, but often vicious. The grain produced, as at most other villages in Koonawur, is insufficient for consumption, and the people subsist by their flocks; there is a pond near this, surrounded by apricot trees, upon which in winter the boys amuse themselves by sliding, but they do not know the use of skates.

This morning the thermometer was eighteen degrees below the freezing point, a shower of snow had fallen upon the adjacent mountains, and every thing indicated the sudden approach of winter; it was now time for us to think of returning, so we decided upon going no farther than Shealkhur. We here received a visit from the Wuzeer Loktus, who has charge of Hungrung, one of the subdivisions of Koonawur, containing ten or twelve Tartar villages, which lies on both sides of the Lee river from Shealkhur to the Sutlej; he came here to collect the revenue, and brought us a couple of *chowrees*, and some fine purple grapes from Soongnum.

20*th October*.—Marched to Chango nine miles, the road was in general good and broad, lying about a mile from the left bank of the Lee river; we found a great deal of red clay at the height of 12,000 feet, and above the hills, were of granite and gneiss. Chango is situate on a pleasant spot between two rivulets near the Lee.

21*st October*.—Marched to Shealkhur, a fort and village belonging to Busehur, under charge of Loktus ; its distance from Chango is three and half miles ; the road was rocky upon the left bank of the Lee, until under the village, where we crossed it by a bad wooden bridge, the bed of the river is here 10,000 feet above the sea, and the breadth of the stream 92 feet ; but it is not nearly so deep or rapid as the Sutlej.

The fort of Shealkhur is situate in latitude 32°, and longitude 78° 38′, upon the confines of Ludak and Chinese Tartary ; it is in a most ruinous state, and the village is a poor place.

The first Ludak village was said to be a day's march to the northward, but as a single fall of snow might have shut the passes, we gave up the idea of visiting it.

From Koonawur to Garoo there are three roads, one from Shipkè has already been mentioned, another from Shealkhur not so good as the former, lies through Choomoortee, an elevated country under a Deba, where the people dwell in tents, do not cultivate the ground, but subsist by their flocks ; the third road from Nisung crosses part of the Himalaya range at a pass called Gangtung, which is represented as being extremely difficult. It is worthy of remark, that the Koonawurees estimate the height of mountains by the difficulty of breathing they experience in ascending them, which, as before noticed, they ascribe to a poisonous plant, but from all our enquiries, and we made them almost at every village, we could find nobody that had seen the plant, and from our own experience, we are inclined to attribute the effect to the rarefaction of the atmosphere, since we felt the like sensation at heights where there were no vegetable productions.

The traders who cross Gangtung Pass put on so many clothes to defend themselves from the excessive cold, that they can scarcely walk ; they wear a large garment with sleeves reaching almost to the feet, made of sheepskin with the woolly side inwards, trowsers and stockings of the same material, a kind of rude gloves of very thick woollen stuff, and caps and shoes of blanket ; they likewise occasionally wrap three or four blankets round them, and thus accoutred, set out on their perilous journey. No herbage is met with on the way for two days, and travellers are said to have dreadful headaches, and pains in the ears even when at rest ; many goats and sheep die annually, and it is no uncommon thing for the people that attend them, who also some-

times perish, to lose their fingers and toes. This road leads past Chubrung, and crosses the Sutlej at Chuksum *Sango*, a wooden bridge with a railing of iron chains, under Tooling a large collection of tents, where there is a temple with a gilt cupola roof held in great repute amongst the Lamas. Leh, or Leo, the capital of Ludak, on the right bank of the Indus, is reckoned sixteen day's journey from Shealkhur. There are several roads from Koonawur to it, one from Wangpo, another from Soongnam, and two from Shealkhur; they are rocky at first, but afterwards improve. Leo is about midway between Kashmeer and Garoo, being eighteen marches from either.

22*d October*.—Proceeded to Lee, a village on the right bank of the Lee river, near the junction of a small stream with it. The distance is twelve miles, and as it was late when we started, we did not reach it until upwards of an hour after dark, and half our baggage did not arrive that night. The road was bad, crossing two rivulets, the ascent from the latter of which was extremely tedious and dangerous, being very steep upon sand and gravel that seemed to have but lately fallen; it was a natural slope, and much caution was requisite to avoid putting the loose earth in motion, for there were no marks of a foot-path; with all our care, however, it was not unfrequent to slip back many yards, and sometimes near a hundred feet of sand gave way at once, carrying the traveller with it, but not very quickly; the greatest danger arose from stones displaced by our people who were a-head, which every now and then whirled past us with astonishing rapidity.

23*rd October*.—Marched seven and a quarter miles to Hango, situate on the bank of a stream flowing to the eastward to mix its waters with the Lee. This valley contains five or six villages, around which there is more cultivation than we had often seen in Koonawur. The road commenced with a steep ascent of 2,500 feet, and then was good and even to Hango, 11,468 feet above the sea.

24*th October*.—Marched to Soongnum nine and a quarter miles; at first we had an ascent of 3,400 feet by a good but steep road to the top of Hungrung Pass, 14,837 feet in height; this pass separates Hungrung from another of the divisions of Koonawur, named Sooè or Shooung, under the Wuzeer Budreedas; the mountains immediately on either side might be fully 1,000 feet above us, but there was little snow upon them,

and none at all in the pass itself. The wind blew with irresistible violence, and although the thermometer was four degrees above the freezing point, it chilled us so much, that the numbness of our hands continued almost until we reached camp, to which we descended by a good broad road cut into long zigzags, and crossed by some rivulets entirely frozen.

Soongnum is a town of considerable extent and beauty, it is situate on the point under which the Darboong and Bonkeeo unite, the former is a stream of some size, and comes from the N. W., the latter is small, and has its source near Hungrung Pass. The dell through which the Darboong flows is broad and level, and almost an entire sheet of cultivation for about three miles; it is a beautiful spot, and the extensive vineyards and number of apricot trees have a fine effect; it is shut in to the north and south by mountains not under 14,000 feet, to the N. W. is a steep and high pass to Ludak, and on the eastward lies the Sutlej, which the Darboong joins under the village of Sheasoo, four or five miles further down the glen.

Soongnum is inhabited chiefly by Lamas, and its extreme height is 9,340 feet. Trees which we had not seen since we left Numgeea, appeared in this vicinity thinly scattered upon the surrounding mountains, they consist of keloo or kelmung and ree, both varieties of the pine; the last kind which produces the neoza almond in shape, resembling the pistachio nut, and in taste not inferior, is peculiar to Koonawur, and does not grow to the westward of the Buspa or Wangpo rivers.

In the evening we were entertained with a Lama concert, which was far from disagreeable, the music was high and low alternately, one set singing the bass and another the treble.

25*th October*.—After crossing the Darboong by a good *sango* we marched to Lubrung, a distance of ten and a half miles; the road was good, winding very much, and crossing the Roonung Pass, 14,508 feet high, at the top of which the wind was as strong and cold as yesterday. We found a great deal of juniper on the way, and the berries were large and well tasted, having little bitterness.

Labrung is a large village upon the right bank of a rivulet called Zong, a couple of miles from the Sutlej, and 9,296 feet above the sea; opposite to it, and a mile distant, is the populous town of Kanum, where

the Wuzeer Loktus resides during winter; there are two brothers, named Buleeram and Busuntram, but they are both generally called Loktus, which word properly speaking, should be applied to their house, a building of great extent.

26*th October*.—Marched to Leepè six and a half miles, the road was bad, lying upon sharp rocks. The houses here, as well as at Labrung, are wholly composed of wood, they are small, and in shape exactly resemble cisterns. Leepè consists of an upper and lower division, both of which contain a good many inhabitants; it lies upon the left bank of the Tetee, a large stream, having its source amongst snow twelve or fifteen miles to the N. W. The vineyards are numerous, and the grapes large and of a delicious flavour.

27*th October*.—Marched to Akpa ten and three-quarter miles. The road was rocky, passing the village of Jangee, and for the last four miles led through forests of pine upon the right bank of the Sutlej, about a mile from the stream.

28*th October*.—Proceeded to Pangee ten and three-quarter miles. The footpath was rugged in the extreme, lying a great part of the way upon fragments of granite and gneiss, which appeared to have but lately fallen, and exhibited a heap of gigantic ruins, amongst which we saw many a noble pine lying prostrate, whilst a few with their branches broken off and otherwise disfigured, just barely peeped above the stones. Large portions of rock fall yearly, and their effects are truly dreadful, they sweep every thing with them, and sometimes stop the channels of the largest rivers for weeks.

From Leepè to this place there is a direct road not exceeding fourteen miles, but we chose to go round by the Sutlej, in order to have a better view of the Kylas peaks.

29*th October*.—Marched to Rogee nine miles. The road was first a very steep descent of 1,000 feet to the Mulgoon, a large stream descending at a considerable angle, rushing over rocks with rapid force, and forming a series of cascades; we crossed it by a couple of *sangos*, the current being divided into two; the ascent from it was fatiguing for a mile, the road then for the next five miles was excellent, leading upon soil through woods of pine, the trees of which attain a large size, but not quite equal to those near Brooang, one of which measured thirty-three feet in circumference; the last one and half mile was of an extraordi-

nary nature along the brink of a tremendous precipice, and often upon unsteady scaffolding that has been constructed with very great labour, this continues for several hundred yards together, and is formed of spars driven into the crevices of perpendicular faces of rock, with their other ends resting upon trees or posts and boards across. Now and then you meet with a rude stair of wood and stone, which must have required much trouble to erect; the rocks project above the path, and the traveller is frequently obliged to stoop in order to avoid them, whilst at the same time he must pay equal attention to his footing.

Part of the road was destroyed last rainy season, and had not upwards of twenty people been early sent off to repair it, we should have been forced to go by the Sutlej, which is nearly a whole march round; by the time we arrived at the place that had given way, they had made several clumsy wooden ladders, which answered our purpose tolerably well. The mountains latterly on either side of the river are craggy, rent in every direction, almost destitute of soil, and thinly wooded, but in the vicinity of Kushbeer, which we passed half way, the ground slopes gradually to the Sutlej at some distance, and is thickly studded with hamlets and adorned with vineyards.

There are several orchards belonging to Rogee, which contain apples of an excellent kind, nearly as large as those brought from Kabool, which they far excel in flavour.

30*th October*.—Proceeded to Meero eight and half miles. The road was very uneven upon angular pieces of quartz, gneiss, and granite, often bordering upon a precipice about a mile from the Sutlej, here called Sumudrung. The rocks on our right hand were of the same cracked appearance as yesterday, frequently overhanging the path, and menacing destruction to the left; towards the river the declivity is more gentle, and generally clothed with pines, unless where they have been buried amongst rocks dislodged from above.

Meeroo is situate in the district of Rasgramee, and is 8,550 feet high. Besides the subdivisions of Koonawur already noticed, there are three more, Utharabeesht on the southern bank of the Sutlej to the westward of Brooang, Pundrabeesht opposite it on the north side of the river, and Wangpo, containing only seven small villages to the N. W. of Meeroo.

31*st October*.—Marched seven and three-quarter miles, and encamped near a cave close on the right bank of the Sutlej. The pathway was

indifferent, ascending and descending alternately, and passing the village of Chegaon or Cholang, pleasantly situate near a stream five miles from Meeroo; half a mile on this side of it the road led through an arch formed of two stupendous rocks of granite, which meet at an angle.

1*st November*.—Marched to Nachar eight miles. The way was rough for four miles to the Wangpo, a large mountain torrent that rushes down a steep declivity, forming a succession of waterfalls in its course, and dashes against the huge masses of rock in its bed with a noise like thunder, throwing up the spray to an amazing height; we crossed it by a good *sango*, and proceeded half a mile upon level ground to Wangtoo Jhoola, a rope bridge over the Sutlej; it consists of five or six cables close together, upon which is laid half a hollow fir tree, about two feet long, with pegs driven through it to prevent its coming off; from this hangs a loop of three or four ropes in which the passenger takes his seat, it is pulled across by two pieces of rotten twine, that from constantly breaking occasion this to be a tedious mode of transporting baggage. The conveyance is a pretty safe one, but greatly alarming to a novice, for the Jhoola is elevated twenty feet above the stream, which runs with great rapidity and a deafening noise. Near this are the remains of a wooden bridge, such as described in Captain Turner's Narrative, that was destroyed on the Goorkha invasion of Busahir. We found the breadth of the Sutlej at the bridge eighty-eight feet, and the height of its bed 5,200 feet, in some parts it is scarcely fifty feet broad, and it was in attempting to swim over at a narrow place that one of my servants was drowned here last year.

After much delay, we got every thing across without an accident, and ascended for three and a half miles to Nachar, where there are a few grapes which seldom ripen; the degree of cold does not depend nearly so much upon the absolute height of the place, as its elevation above the bed of a river, for vines come to maturity upon the banks of large streams, 9,500 feet from the level of the sea, and Nachar does not exceed 7,000 feet in height.

2*nd November*.—Proceeded eight miles to Turanda in Utharabeesht, and three miles from the western limit of Koonawur. This day's march was beautiful, for the first three and a half miles upon soil and through shady groves of lofty pines, from twenty to twenty-seven feet in circum-

ference, the road then was a rocky descent of one and a half mile to the Syldung, a rapid torrent dashing over large stones, and coming from the Himalaya mountains to the southward; we crossed it above the union of two streams by a couple of bad *sangos*, and then ascended from its bed by a rocky footpath, winding amongst extensive forests of oak, yew, pine, and horse chesnut to camp.

3*rd November*.—We were detained by a heavy fall of snow and hail, which lay around us in large quantities many hundred feet below the village; had this shower come on ten days ago, we should have been prevented from crossing the passes near Soongnum, which together with those above 13,000 feet, are blocked up for four months in winter.

4*th November*.—Marched to Soorahun thirteen miles. It took us almost the whole day to perform the journey, for the path which is at all times dangerous from often lying near a precipice upon smooth stones, by the late shower of snow, now frozen hard, had become so slippery, that we could get on very slowly.

We crossed four streams of some size, besides many smaller ones, they are all rapid, but of no great depth. The mountains near this are heavily wooded to their summits, the cultivation increases at every step, and the villages are most thickly scattered.

Soorahun is 7,248 feet above the sea, in Dusow, one of the large divisions of Busahir; it is the summer residence of the Rajah and most of his Wuzeers, who stay here six or seven months in the year to avoid the great heats at Rampoor; it contains several good houses, and a temple attended by Brahmins.

5*th November*.—Marched to Dhar nine and a half miles. The road was bad crossing the Munglad, a rapid torrent, by a rotten *sango*, consisting of two fir trees, about a foot apart, with small twigs and slates laid across, one of the spars is much lower than the other, and the bridge is both unsteady and unsafe; the descent to the stream was at such a great angle, that we frequently slid many feet at a time, the ascent was equally bad, lying upon pure mica, shining with a bright lustre, and extremely slippery.

6*th November*.—Marched to Rampoor, distant eight and a quarter miles. The road was sometimes rugged; but more commonly even; part of the way it was a complete swamp, lying through rice fields intersected by many rills.

Rampoor is situate in latitude 31° 27′ and longitude 77° 42′, on the left bank of the Sutroodra or Sutlej; although the capital of Busahir it is not near so populous as might be expected. There are several fairs here during the year, to which the Koonawurees bring blankets of various sorts, coarse shawls, wool, raisins, salt, borax and chowrees, and exchange them for wheat, tobacco, sugar, swords, &c. The houses may be about a hundred in number, they are large, well built, and covered with thick slates of a brownish colour, which form very heavy roofs; upon a few of the houses the slates are cut into oblongs, and laid regularly, which give them a neat appearance, but by far the greater number are of all shapes and sizes, and put on without any regard to order. Under the rajah's palace, a handsome edifice at the northern angle of the town, there is a rope bridge similar to the one at Wangtoo across the Sutlej leading to Kooloo, the breadth of the river is here 211 feet, and the *jhoola* is elevated thirty feet above the stream, which in the rainy season is said to come within four feet of it. In December and January when the river is at its lowest, people sometimes cross upon inflated skins. We found the bed of the Sutlej by barometrical observations 3,260 feet above the level of the sea.

The site of Rampoor is low and much confined, and one of the worst that could have been fixed upon, and from its being encircled by high mountains subtending an angle of between twenty and thirty degrees, a breath of wind can scarcely ever reach it; there is little soil and no wood upon the surrounding hills, and large portions of naked rock appear on every side of the town, which being once heated, retain their warmth for a long time, so that in summer the nights are not much cooler than the days, and from there being no circulation of air, the place for several months in the year is like an oven.

7th November.—Marched to Nirt upon the left bank of the river. The distance is twelve and a half miles, and the road for the first four and a half consisted of short rocky ascents and descents to the Nouguree, a large stream coming from the eastward; we crossed it by an excellent high *sango* with a railing, and the rest of the way was quite plain, lying near the Sutlej.

The extreme height of the bed of the river opposite to the village is 2,912 feet, and as this is the last place where we had an opportunity of

measuring it, I shall now endeavour to give some idea of the probable height of Mansurowur Lake.

The Sutlej has a variety of names, being called Sutlooj, Sutroodra, Sumudrung, Sampoo, Langzhing-kampa, Muksung, and Zung-tee in different parts of its course; Sutroodra is most commonly used, by which name it is known from its source to the plains. In the Koonawur language, the words Sampoo, Sumudrung, Kampa, Muksung and Tee, all signify river. Zung means gold, and with the addition of the latter word is applied to the stream at a sandy place near Murung, where gold dust is found. By the accounts of many people who have travelled along its bank to its source, it issues from Lake Rawunrud, called also Rawathud and Lanka, which was confidently said by every body I saw that had been there, to communicate with Mansurowur, although Mr. Moorcroft could not dicover the outlet of the latter lake; the circuit of Rawunrud was represented to be no less than seven days' journey, but it is most likely both lakes were included.

From Nirt to Sundum Sango under Numgeea, the horizontal distance by the map is seventy-two miles, although by the road it is almost 140, the difference of level of the bed of the Sutlej in this space is about 5,690 feet, which gives the fall of the river nearly eighty feet per mile in a direct line, from Numgeea to Mansurowur, which is placed agreeably to Major Hearsey, (I fancy not far from the truth, as its position with regard to Shipkè agrees well with the accounts I received,) the horizontal distance is about 167 miles; if therefore only thirty-five feet per mile be allowed for the fall of the river from Numgeea upwards, it will give the extreme height of Mansurowur or Mapang Lake above 14,000 feet, and I am inclined to think this estimate rather under the truth than otherwise, for Mansurowur is unquestionably very elevated, from the circumstance of four large rivers, and perhaps five, taking their rise in that quarter.

1*st*.—The Sutlej issuing from the lake itself.

2*d*.—The Sind or Sing-kechoo, known likewise by the name of Sindke Kampa, has its source N. E. of Mansurowur. It is described as a very large river, and the principal branch of the Indus, being frequently called Attuk even near Caroo, three marches to the eastward of which it passes, running close south of the capital of Ludak, and three or four days' journey to the northward of the valley of Kashmeer.

3*d*.—The Tamjoo Kampa springs from the mountains east of Mapang, and at first flows towards the eastward.

4*th*.—The Manja-choo, or Kampa, rises sputh of Mansurowur and runs S.E. The latter two rivers I conclude to be the Bruhmapootr and Gogra.

I likewise heard of a fifth river (but only from the accounts of one person, which however I have not the least reason to doubt, as he travelled the road twice,) said to be crossed eight or ten marches E. N. E. of Garoo ; its source is reckoned near Mapang, and it runs N. E., so is perhaps one of the great Chinese rivers.

8*th November*.—Marched eight and three-quarter miles to Kotgoor, where there is cantonment for two companies of the 1st Nuseeree Battalion. The road at the beginning of this-day's journey lay close upon the left bank of the Sutlej, and then was a steep ascent of 3,500 feet, latterly winding amongst beautiful woods of oak, yew, and pine.

10*th November*.—Proceeded seven and quarter miles to Kutoo, in order to make some astronomical observations, and get the bearings and altitudes of the surrounding objects. The ascent from Kotgoor is not less than 4,000 feet, the road at first was good, but afterwards steep and rugged. Kutoo consists of two small forts upon the top of a hill, 10,600 feet above the level of the sea, connected on the N. E. with the snowy mountains. The prospect from this spot is very extensive; upwards of fifty forts, with from four to six towers each, may be distinctly counted in the Rajships of Kooloo, Sooked, and Mundee, N. W. of the Sutlej, beyond these are seen high mountains covered with eternal snow ; to the N. E. and East, appear the outer range of the great Himalaya chain, extending until it is lost in the horizon, whilst to the South and S. W. the hills decrease in height to the plains, which are clearly distinguishable at a distance.

We were detained here until the 16th, for we were involved in mist for several days, during which time we could not see half a mile on any side ; the thermometer did not get above 34° in a house, with a large fire for two snowy days, and at sun rise was 28°, but when the clouds cleared away, it rose to 40° and 41° at noon.

After completing our observations, we returned on the 16th to Kotgoor, where we stayed a couple of days, and on the 19th marched to Jeemoo nine and half miles. The road for about four

miles was generally good, passing many villages, and lying upon the face of a left hand range covered with dark forests of various sorts of trees to a small stream, from whence there was a steep ascent of 2,400 feet through a thicket to Nagkanda Pass, 9,000 feet high, here we found a great many hazel trees, but all the nuts were rotten; from the pass to camp, we had a moderate descent of three miles upon the slope of a grassy range that lay upon our right.

20*th November*.—Marched to Muteeana nine miles. The road for near six miles was good, upon the right bank of a rivulet, and crossed by many brooks to Mandunee, where there is a handsome temple built in the Chinese style; after leaving it, we crossed the Kuljehur, a stream coming from the northward that divides Koomarsaen from Keoonthul, two small states under chiefs called Ranas. Keoonthul is largest, and extends from Muteeana to the vicinity of Soobathoo. The descent to the Kuljehur was steep, and the ascent equally so, each about 1,000 feet. The mountains we passed are wooded with pines and oak in the vallies, but above produce little except grass.

22*nd November*.—Marched to Bunee fourteen and three-quarter miles. The road consisted of easy ascents and descents near the top of a range upon soil, and through a very highly cultivated country abounding with villages.

23*d November*.—Proceeded to Simla eleven miles, and next day made a forced march of twenty-two and a half miles to Soobathoo; the latter part of the road has already been described.

Throughout the above mentioned tour, the road was surveyed with some care, and a number of points were fixed trigonometrically, which agree well together; we were very lucky in having clear weather, and always managed to get two, but most commonly three or four meridian altitudes of stars, both north and south, contained in Dr. Pond's catalogue, at every halting place except one.

We had two sextants, and a Troughton's reflecting circle having a stand, with the last of which instruments the latitudes were usually observed. We carried no less than fourteen excellent barometer tubes with us, only two of which returned in safety. The mercury was revived from cinnabar, and was well boiled in the tubes, the last indeed was a most laborious business, for we broke upwards of a dozen of tubes in the operation. The most convincing proof that the air was entirely expelled,

is, that the mercury in the tubes of thirty-two and twenty-six and a quarter inches stood exactly at the same point, although the vacuum in the short ones was not more than three-quarter of an inch, and on applying a candle to the top, the mercury rose a little, whereas had there been the least air, it must have sunk from the expansion, which would have been clearly perceptible in so small a space.

The largest theodolite was constructed by Troughton, and is graduated, both vertically and horizontally, to twenty seconds; the elevations of most mountains subtending small angles were taken with it, and those above ten degrees, were observed either with the sextant or circle and artificial horizon.

At every camp we tried the height of the boiling point with two good thermometers, which very seldom indeed gave the altitude of the place 300 feet different from the barometer, and had we arrived at our ground in sufficient time to distil water, I have every reason to think the disagreement would have been less, for wherever we had an opportunity of using snow, the coincidence of the two methods was most satisfactory.

The height of the colossal Tuzheegung, whose summit is almost 22,500 feet above the level of the sea, was determined by angles of elevation between four and twenty-four degrees, taken at eight different stations, varying from 9,000 to 19,000 feet in height, and from two to about thirty miles distant from it, and allowing one-fifteen terrestrial refraction, the extreme difference between any two of the observations does not amount to 250 feet. The Kylas Peaks, besides several others, were calculated from many stations at various distances, and none of them differ above 500 feet from one another. The next highest peak to the Tuzheegung is above 21,000 feet, it was seen from Hutoo fifty-three miles distant under an angle of 1° 47′, and its altitude deduced from this comes within 200 feet of what the observation at Rogee gives it, where the distance was eight miles, and the elevation about fifteen degrees.

The altitudes of our stations were calculated by M. Ramond's method above Soobathoo, where the barometer was observed five or six times a day during most part of our absence, and the height of the column was invariably measured from the surface of the mercury. By the mean of a whole year's barometrical observations, Soobathoo was found to be 4,205 feet above the level of the sea.

Memoranda on the Geology of Bundelcund and Jubbulpore. *By* Dr. J. Adam, *B. M. S.*

The following paper has been found amongst some old records, and it has been thought that its contents well entitle it to be rescued from oblivion. I am happy also to add that the collection to which it refers is now safely placed beyond risk of loss in the Society's cabinets. Being No. IV. of our Geological Catalogues.

The observations I have now the honour to lay before the Society, were originally intended to accompany a series of geological specimens, for the purpose of illustrating their relative positions and localities, or (according to the technical phraseology of the day) their *geognostic* and *geographic* situations, without a knowledge of which, no collection can be of much value. At the time, however, of dispatching these, I was still prosecuting a long march in a remote part of the country, and could not then command leisure sufficient to enable me to throw together the detached memoranda I had committed to paper in the early part of the route. Other circumstances afterwards interfered to prevent my putting this intention into execution, and it is only lately that I have been reminded of it, by finding in the Museum below, the collection to which the notes refer.

While, with all deference, I solicit the attention of my fellow members to the subject of the following pages, I must at the same time crave their indulgence for the imperfections in the manner of treating it, necessarily arising out of the scantiness of my materials. In moving along, from day to day without intermission, I could only take a very hasty survey of the geological features of the districts through which I passed, and was often thereby precluded from obtaining all the information desired. I trust also, they will make allowance for the want of interest inherent in such details. The objects of geology present little to allure a general enquirer; and indeed taken singly, may be said to be the least attractive that can engage the attention of mankind. A bare rock, or a clod of earth offers in itself nothing interesting. But when viewed in combination with surrounding objects, when contemplated in its relation to these, its local site duly considered—and the influence which it may exert in the mass on the animal and vegetable world; it then assumes a higher degree of importance, and the study will

be found not only a pleasing one, but a source of great public utility. Observation pointing out the path, the geologist ascends from facts to inferences, gradually but surely ; and though the way may be said to be long and wearisome, he obtains at length, in the great truths which it leads to, an ample recompense for all his toils. To trace the changes on the ever-varying surface of this globe ; to compare the present with the past, and thus to study the history of its inhabitants in their several epochs of existence, from the shrub and insect up to man, the proud lord of all, constitutes the paramount aim of this research ; while the discovery of new minerals, or their compounds, and new applications of them to the arts of life, stamp on his labours an additional value that they would not otherwise possess.

To qualifications leading to any such results, I have not the smallest pretensions, nor dare I aspire to the title of geologist from merely noting down a few simple facts and deducing the most obvious conclusions from them. Should the detail, however, prove the means of exciting those to prosecute the study of Indian geology, who possess greater ability and opportunities, I shall feel that my time has not been wholly misemployed. I need urge no stronger plea than this expectation for again bringing before the Society a collection apparently so little worthy their notice.

These specimens comprise all the rocks met with, between the Jumna and the Nurbudda, by the route of Banda, Lohargong, Bellary and Jubbulpore. They commence with the hills in Bundelcund, after crossing the Jumna at Chilly-terrah Ghaut. Between the hills and the river is situate a plain of considerable extent, the aspect of which differs so widely from that of the opposite country in the Dooab, as to merit particular notice. It may be observed, generally, that the soil of the plains of Hindostan *intra Gangem*, is a light coloured mould, consisting of a due proportion of argillaceous, siliceous, and calcareous earths, the last being most abundant above Monghyr. Its chief character is derived from the quantity of mica which it contains in minute grains and scales. This also prevails in the district I passed through from Allahabad to the Ghaut on the Jumna. About half a mile from this river we descend a bank, which at one time may have formed its boundary in the rainy season, and enter upon a low flat, where in place of a fair, shining, attenuated mould, the eye meets nothing but an uniformly

dull coarse black earth, not unlike the half-digested soil of moss-lands at home. This dark soil is still more striking on the Bundelcund side, and continues almost the whole way to Besseramgunge. It seems to contain a larger proportion of argillaceous earth and vegetable recrement, than the lands on the left bank of the Jumna, and that generally observed in the Upper Provinces of India.

The Jumna, where the passage is made, is a smooth gently flowing stream. The banks shew no rock, but are high and perpendicular, and when viewed from the opposite shore along with the Kane, (which here joins its waters to the Jumna,) they look rather interesting, and are devoid of the dullness which characterizes the banks of the united rivers below Allahabad.

On approaching the town of Banda, distant two marches or about twenty miles from the river, several small hills are seen in the West, like erections for flagstaffs posted at regular intervals. They are of a conical, or rather pyramidal figure, and appear to run in one line from N. W. to S. E. One of these rises from the plain close to Banda. It is about three or four hundred feet high, and divided at the upper part into two or more smaller elevations, of which the central alone terminates with a pointed summit. The appearance of this hill from below is singular and fantastic; huge masses of stone presenting themselves in every position, and seeming quite unconnected the one with the other, while the few shrubs growing out from between them, serve as a contrast to the nakedness of the rock. On ascending the hill, we find this to be a reddish small-grained granite, having no regular arrangement, but lying in blocks of great size, some perpendicular, and others horizontal, with a convex or rounded surface in general. Many of these are scaling off; but the greater part remain perfectly entire, and possess more compactness of *integrant* structure than any rocks of the kind I have met with.

This hill at Banda may be considered to be the termination of the first of many series which traverse Bundelcund from W. to E., as no more are observed here. Following that line, soon after leaving Banda to the South, other hills come into view, and at first sight appear larger than the one at that place. This is chiefly owing to the effect of distance, increased by the dewy air of the morning; for on a near approach, we find these not to exceed the congeries at Banda, or the

highest does so only on a small degree. Though evidently entering upon a mountainous country here, we are surprized to observe no general elevation of the surface; the same flatness of the plains continuing as on the opposite side of the Jumna, and the hills rising abruptly from a common level, like so many islands rearing themselves out of the ocean. They are, in fact, mere pictures on *dry* land of the rocky Madeira, Porto Santo or the Canaries, as seen in the voyage from England to India. At the village of Gerawah, twelve miles from Banda, we reached the second series. The general figure of these hills like the former mentioned is pyramidal, and they may be said in this respect, to resemble a fragment of the granite which composes them. They stretch from the village of Gerawah* in two or three directions, the line of some crossing that of others, and notwithstanding their irregularity as a range, they appear to follow individually particular series, and we can trace a succession of isolated rocky elevations, forming a sort of chain across the country. The largest of these situate to the right of the village, has at its summit a rock of a white colour like chalk, which I regretted the distance prevented me from examining. The others are composed entirely of granite similar to the rock at Banda, and present in general, the same deficiency of arrangement. There is, however, one apparent exception at the highest part of the hill immediately overlooking the village; *there* the piles have assumed the appearance of basaltic columns standing perpendicularly with four sides, and at a small distance, seem to be a superincumbent stratum of a different formation from the others underneath. On approaching as near as I could, I found the rock essentially the same however, but was at a loss to account for this peculiarity in its outward form. As I moved along the projecting blocks and ledges of this hill, I was particularly struck with the extreme heat which they retained. Although the sun had gone down some time on the opposite side, this was still so great as to be barely tolerable to the hand, and the atmosphere over them was proportionately elevated in its temperature.*

The country around here displays a thousand charms, compared with the district near the Jumna. The roads are dry, and the rocky elevation in front having a covering of beautiful shrubs entwined with every variety of climbing plant, which give quite a new feeling to the mind on

* Sp. No. 1 to 3.

viewing the prospect. New animals too, inhabitants of these, present themselves. The peacock arrayed in all Iris' gorgeous hues, and shining in his native plumage, is not unfrequently seen perched on a block of granite, while herds of antelopes bound along the plain below, and the shrill cry of the Indian partridge heard on every hand, first cheers the traveller with the opening day.

At Pungrawah,* the second stage from Banda, we findthe rocks on every respect similar to those described. In the march from Pungrawah to Kurtal, the next village on the route, a range of hills is seen in front, and on the left hand, much higher than any previously met with, and which, in place of the peakeds ummit, are crowned with a flat *table-land*. On one of the most conspicuous of those to the left stands the celebrated fort of Callinger. On reaching Kurtal, we still find peaked hills composed of granite, having the same characters as that at Bandah, Gerawah, and Pungrawah: and besides this, masses of a bluish coloured trap and large boulders scaling off in concentric layers. This trap rock appears to have been at one time extensive; and I could trace a superficial stratum over the granite for some way up the hill. What remains of it rests on that rock, without any distinct arrangement. The whole seems much affected by the operation of the elements, and it is probable, that from this cause a large formation has been removed and reduced to soil. Many of the granite blocks here are also fast going into decay, and the soil of the district adjoining is entirely formed from them. Its colour is sandy red, that of the felspar, and in this red sand, as a basis, are contained a great many small quartz crystals, which still remain entire, and unaltered in their structure. Chalcedonic pebbles are also found at the bottom of the hills at Kurtal, which appear to have been imbedded in a rock that had likewise rested at a former period over the granite. They possess the same characters as the pebbles found in the river Kane, that are so much admired on account of their beautiful variegated appearance and lustre when cut.

After leaving Kurtal, the road strikes into a wood of low trees, flanked on both sides by hills with flat summits; and for the first time we observe pieces of sandstone strewing the path, mixed with broken blocks of granite, and the more complete detritus forming the soil. On one hill, which is nearer than the others, we can distinctly see a horizontal position of the superior strata; and under the table face, a

* Sp. No. 4 to 8.

sort of projection enlarging the diameter of the hill, and gradually increasing to the base. The upper formation is evidently of the same nature as the detached pieces of sandstone found at the surface, while the great body of the hill is composed of granite, (and also perhaps trap,) similar to that of the pyramidal hills formerly described. Some *fuqueers*, or religious devotees, have taken up their abode on this hill, at the junction of the sandstone with the granite formation, and the face of their caves cut out of the solid rock, and *chunamed* over, with the elevated platform on which are placed the objects of their idolatrous worship, present altogether a very striking and conspicuous appearance from the plain below.

On passing the *fukeer's* hill, we came in sight of the eastern extremity of Adjeeghurh.* This fort like Callinger, crowns the summit of an isolated hill, and derives its principal strength from a *table-face* of sandstone rock. The sides of the elevation are covered with thick jungle, composed of beautiful low trees of every shade of green in their leaves, and of every size and shape, from the pinnated peaked leaflet of the tamarind to the broad expanded foliage of the teak, which, according to my knowledge of Indian dendrology, is very abundant in all these hills.

As far as my limited observation enabled me to determine, granite forms the great body of Adjeeghurh, and sandstone lies over it at the upper part, presenting all round a perpendicular face of rock to the height of between thirty and fifty feet, and constituting a natural barrier of defence, that of itself seems to render the place impregnable. The sandstone has a slight reddish tint, and is of the formation termed the old red sandstone Its position is perfectly horizontal, and its structure in general quite sound. The view from the ramparts of the fort displays well the peculiarity I remarked before, respecting the want of general elevation in the whole of this mountainous tract. Hills are seen in every direction covered with jungle, and rising abruptly out of an intervening flat country, the dull and cheerless aspect of which conveys to the mind the idea of an uninhabited waste, or the haunt of savage beasts only. It is precisely the expression Daniel has given in his delineation of a fort in the Mysore, where a sort of sombre stillness reigns, (if I may be allowed so to term it) that no language can pourtray. Adjeeghur and Callinger are no less

* Sp. No. 9 and 10.

interesting to the antiquary and mythological enquirer, than to the geologist; and the lover of arts will find abundant subject of admiration in the beautiful remains of ancient Hindoo architecture which still exist within the walls of both these forts.

The country for a short distance from Adjeeghur is open, and the soil which hitherto had partaken of the qualities of the prevailing rock, again resembles that on the other side of Banda. It is of a dark colour and soft, what by agriculturists at home would be termed *rotten soil*, the "*putre soliem*" of the Poet.

"Nigra fere, et presso, pinguis, sub vomere terra"
"Et cui *putre soliem*————"
"Optima frumentis; non ullo exæquore cernes,"
"Plura domum tradis, decedere plaustra juvencis."

A few miles further on, we came to the village or hamlet of Besseramgunge, beautifully situated at the foot of a wooded hill over which are the Ghaut passes to the upper district. This Ghaut leads from the low country of Bundelcund to the elevated table-land on a level with the hills last mentioned. The path is cut through, or carried over granite, trap, and sandstone. At first the ascent, though pretty steep, is not difficult, as there are few large stones, and no rock rising from the surface. Soon, however, it becomes steeper and more obstructed; granite, trap, and sandstone masses presenting themselves in succession, and in many of the last, may be perceived *quartz* nodules included, like those found in the sandstone of Table Mountain at the Cape. The arrangement of the sandstone is in general horizontal, but at some points it appears to rise from the surface, in the form of ridges almost vertical. The trap rock exhibits no well defined arrangement at the several points where it is found in the Ghaut; and I could not penetrate into the jungle here to examine the strata more extensively. It may, however, be inferred, that it is in every respect similar to that rock at Callinger, which I afterwards found lying chiefly in rounded masses of various sizes, occupying the middle of the elevation, and composing the greater part of it. These were in general mouldering at the surface, and many of the smaller boulders could be reduced to powder without the assistance of the hammer. The larger masses were more compact, and possessed great hardness. This rock belongs to the transition trap of Werner, to

which class may also be referred that formerly met with at Kurtal, lying immediately over the granite of the peaked hills. The elevation may be altogether from 1,000 to 1,200 feet above the plain of the Jumna.

On reaching the top of the Ghaut, we cross one or two clear running streams, and some oozing rills and pools of stagnant water are met with, most of which indicate, by their blue slimy and iridescent surface, an impregation of iron in the adjoining soil. This is indeed composed of ferruginous gravel and reduced sandstone, and if we may judge from the luxuriant grass growing over it, it must be one of considerable fertility. The town of Punnah is distant about eight miles from the Ghaut, and the whole of the surrounding country here derives an additional interest from its being the source of the diamond. In my march thither, I passed several of the mines close to the road, but having resolved to halt a day at the town, I deferred my examination of them till the following morning.

Having started early next day, I soon reached the scene of operations, distant about three miles to the westward of the town, and in a situation corresponding to that on the other side. It was a thin jungle, with long delicate grass growing out of a reddish soil. The mines are mere narrow pits, four, five, or more feet deep, according to the distance of the subjacent rock from the surface, and dug out of a ferruginous gravelly soil, of a dark brown or blackish colour, like hepatic cinnabar.* It feels moist, and consists of fine sand, with a large proportion of small dark red and whitish, or *yellowish-white* pebbles, the former appearing to contain a large quantity of iron. When I arrived at the ground, two men were engaged in searching for the precious mineral, the chief of whom very readily replied to all my questions, and explained and exemplified the series of operations gone through. These are extremely simple. The soil,† as it is brought from the neighbouring pit, is thrown into a small square excavation in the ground, about two or three feet deep, the sides of which have been well beaten to prevent the gravel from adhering to them; a quantity of water being added, a man steps into the place with a small hoe and mixes the whole together, using his hands also for that purpose, and tossing away all the larger pebbles. This movement being continued for some time, the water is then thrown out by means of a small wicker

* Sp. No. 11. † Sp. No. 12.

basket, and carries with it the sand, leaving the gravel behind. After repeated application and discharges of water, the gravel is removed into another small basin of a circular figure, where it receives the last washing. From these it is conveyed to a large floor on the surface of the ground made of hardened earth, and there left to dry; the finishing operation consisting merely in a minute examination of this dry gravel, by a person acquainted with the external characters of the jewel in its rough state. Judging from the condition of the people employed, one would hardly believe that they could be able to detect a stone, but they assured me, they did so with the greatest ease, and it appears to be the transparency and lustre, even in this state, which directs them. The chief man picked out several pieces of transparent quartz from the gravels which he said resemble the diamond, "he had found them of "all colours and sizes, but the discovering of these, he added, did not "depend upon his own skill or exertions, it was altogether the "work of God,"—salaaming at the same time respectfully; and pointing with a most expressive manner to the heavens.

From the inquiries I made, diamond mining appears by no means a profitable concern at Punnah. Any one may dig, subject to paying the common duty of a fourth part of the produce to the Rajah, who is here, (as is the case every where else in Hindostan,) paramount lord of the soil. All stones, however, beyond a certain carat, are exclusively claimed by him; but it may be supposed, where the means of concealment are so much in the power of the workman, that the prince's treasury very seldom benefits by this source of revenue. In the farm or spot which I examined, two diamonds only had been found during the preceding year, and these fetched each 200 rupees. The number of workmen commonly employed, (in the various operations of digging, carrying, washing, and searching,) is from four to five, though I saw only two. Of these, the *sirdar* or chief, has a salary of five rupees per month, and the others have four, and when a valuable stone is found, some present proportioned to that, is generally made them by their master. So that after paying the duty and expence of working, it is obvious his gains in this instance must have been very small and not sufficient to induce him to persevere much longer in these operations. Indeed, the business of mining appeared altogether at a stand when I passed the spot; and judging from the remains of pits in every direc-

tion, it must have been carried much more extensively in former years than at present.

Red ferruginous gravel, the *matrix* of the diamond, may be considered as terminating the regular formations of the hills in this part of Bundelcund, the order from below being granite, trap, or basalt sandstone and gravel.

In taking a comprehensive view of these four formations as developed at the different sites mentioned, whether singly or in combination, we must at the same time consider the qualities of the soil in the intermediate and adjoining districts derived from them.

The prevailing soil in Bundelcund, and indeed all the way between the rivers Jumna and Nerbudda, is the black coarse earth already alluded to, consisting apparently of a larger proportion of clay and carbonized vegetable remains than is found in the lands to the north of the former stream. It retains moisture more perfectly than the common soil of Hindostan, hence its miriness in the rainy season, and its disposition to unite into masses, and form rifts and cracks during the dry and hot weather. Even in its driest state, however, it has not the stony compactness of pure clay soils, but when separated in small pieces from the mass, is found to be friable and easily reduced to powder. I think it probable, that this contains a proportion of magnesian earth, though never having subjected it to chemical analysis, I am not warranted in drawing this inference from any accurate data. It is reckoned exceedingly fertile, and the richness of the Bundelcund lands, where this soil predominates, is quite proverbial in India. From its quality of retaining moisture, the process of irrigation is not so frequently resorted to, and the labour of the husbandman becomes thereby lessened. Greater exertions, however, are necessary for preparing it for the seed, and in keeping it clear of weeds, than we see applied to the lands in Hindostan generally. A long grass, not unlike some of the troublesome varieties at home, was then springing up every where, at the time I passed through the district, and formed the only obstacle to the ploughing then going on in all directions.

One would imagine that the above characters of the soil would affect the atmosphere, and render the climate of Bundelcund moist and unhealthy. As far as my own observation extends, agues are very prevalent in the whole of the low country, and sometimes prove so

severe in European habits, as to require a change of air for their removal, but the native population do not seem to suffer from any endemial diseases of this class in a greater degree than the inhabitants of other parts of India; and their appearance upon the whole, as presented to myself, was rather prepossessing, and indicated general good health and comfort.

This black soil has evidently been derived from the decomposition of some of the many varieties of trap rock, most probably amygdaloid or green earth, which appear to have rested at one time over the granite in the hills of Bundelcund. The trap rocks at Gerawah and Besseramgunge, and the globular variety observed on the hill of Callinger, may also have had a share in forming it. As I remarked before, many of the trap boulders are now in a soft state bordering on earth, and can be reduced to powder with the greatest ease. The soil immediately around, there can be no doubt, is formed from their *debris*, and as the plain in general resembles that, we may reasonably infer, that it also acknowledges a similar source.

Extensive forest, which it is not difficult to conceive had flourished here at no very distant period, may have furnished the vegetable matter; and the successive increase of a heavy moist soil covering the wood with each return of the rainy months, had prevented its complete decay. For the amelioration and improvement of such a soil in Europe, the agriculturist would have recourse to lime, as rendering it drier, and reducing the vegetable matter it contains to a state more fitted for supplying the requisite nourishment to the growing plant.

In India, however, such an expedient would not be attended with success, from the peculiarity which calcareous earth displays here of uniting into small masses, termed kunkur, and not mingling well with the other component parts of the soil, unless where siliceous sand happens to exist in an unusually large proportion. A mixture of this sand, either derived from sandstone rock or the *debris* of granite, and similar compound rocks, might be attended with the desired effect. We should certainly expect a favorable result from reasoning on the subject, but I am the more induced to think so from actual observation of another part of the same district, between Cullinger and Allahabad via Turrowa. There, a considerable change is indicated in the colour and properties of the soil. It becomes lighter as we proceed, and more attenu-

ated; and seems to have been formed by the commingling of the alluvial deposit of the Jumna, with the black earth of the plain. Its fertility, if I may judge from the richness of the crops at the time I saw them, must be very great. The whole country towards the river presented one aspect of bountiful nature, and might well vie with the poet's "Gargara," in the ease with which it is cultivated, and the ample produce it yields the husbandman in return.

The appearance of the first hills in Bundelcund has been already described. It is quite characteristic of the granitic or purely primitive formation. Their outline, contrasted with the table-face and summit of those in the interior, exemplifies in a striking manner the effect of rock on the figure of mountains in general, from which we can often determine at the distance of many miles, the nature and position of strata forming extensive ranges. Hence too, we perceive the connection between geology and painting, and the advantages to be derived to the artist from an acquaintance with the elements of this science. The tops of the Himalya mountains, as represented on the splendid views of Mr. Fraser, may be inferred a *priori* to consist of granite from the mere circumstance of their form. They exhibit precisely the same outline, "*magna componere parvis,*" as the isolated primitive hills in Bundelcund, but having their cliffs so softened by distance, as to present a uniform line at the various angles visible.

As to the manner in which the primitive hills in Bundelcund have been formed, it might seem presumptuous in me to hazard an opinion; the question involving in some measure the two grand theories of Hutton and Werner, that have so long divided the geological world. Yet it is impossible to contemplate the eminences at the same time with the ranges in advance, and not form some conclusion on the subject.

They appear to exhibit the *cores* of large hills, the exterior of which has suffered in the lapse of time; their more compact granitic interior still enabling it to resist the natural causes of decay. I think it most probable, that the whole of the district from which they rise, had at one time presented an uniform flat consistency of the three formations of granite, trap, and sandstone, in the same order as they are now found on the hills, and that some force from below had elevated the primitive rocks, causing also a disruption of the secondary strata.

Where this force was but slightly impressed, and on a limited area, a

small elevation would be formed. The granite would then only break through the superincumbent strata, without carrying any part of them along with it, while the broken strata would rest on the sides of the mass after the impelling force ceased to act. The figure of the hill, then, would not be a pyramid which it now resembles, but would approach more to that of a core; sandstone, trap, &c. lying on, and surrounding the granite and filling up its inequalities, and the direction of the strata of each of these deviating, more or less, from the horizontal line in proportion to the elevation of the central mass.

We could thus picture to ourselves a hill more extensive than any of those now existing in the first series, the sides of which were composed of sandstone ledges, and the summit of a pointed block first, or mass of granite, or crowning the whole, may have been a table of comparatively small dimensions. Their original height in this case, may have been from thirty to fifty feet greater than their present, that being the average of the sandstone strata on the hills in advance. The process of reduction or diminution of bulk may be conceived to have taken place in the following manner. The sloping sandstone being acted upon by the elements of air and water, joined to the heat of the sun, had first undergone disintegration. The sand thus produced, would be washed down by the torrents in the rains to the base of the hill, and there spread out and form soil. This operation being continued, in course of time the whole of the inclined sandstone would be removed, and the trap or other rock immediately beneath it, come to be exposed in its turn. From the same cause which acted on the sandstone, this would also undergo a change, and ultimately be reduced to soil, covering the *detritus* of the former as it was deposited. The small table on the summit, in the course of these operations falling into fragments and rolling down the hill, would be exposed to the same successive changes as the sloping strata, and thus after the lapse of ages, nothing remain but the central primitive granitic mass as it is now displayed, forming, to use an anatomical illustration, the skeleton of a body which once existed. Both the ranges then, (the peaked, or primitive hills, and the tabular,) have been produced by similar causes, and at one time have been composed of similar materials, the only difference arising from the size of the primitive or granitic base. The sandstone so often mentioned, and the ferruginous gravel lying over it, are of very fre-

quent occurrence in what are termed the Vindhya chain of mountains, from the centre of Behar to Malwa. The hill of Chunar consists entirely of the former, and in the range to the south of that station, the gravel is met with, as I have been informed, in great abundance.

The same association is observed in Bundelcund, and all the way to the Nerbudda; so that it may be inferred from this connection subsisting between them, as well as their coincidence in chemical properties, that the one is formed from the other. In what manner the chalybeate impregnation has taken place is not very evident, nor the source from whence the metal has been derived; but there can be little doubt the gravel is a secondary formation of the sandstone rock, and one too in all probability going on in many situations at the present day. It is interesting, as being the *matrix* of the diamond, both in the old and new world, and much speculation is necessarily connected with it on that account. It would, however, be foreign to the object of this communication to inquire into any opinions not obviously suggested by the facts detailed, and nothing occurred to me at the time I examined the gravel formation at Punnah and elsewhere, that promised to elucidate the origin of this highly prized jewel.

In proceeding southward from Punnah, we very soon approach another series of small hills, or cliffs, that rise out of the table-land to the height of one hundred feet or upwards. These elevations are also flat at the top, and composed entirely of sandstone, in every respect similar to the strata at Adjeeghurh and on the Ghaut, of which indeed they are but a part. For eight or ten miles the road here ascends occasionally, and we seem to cross over a low ridge connecting the hills to the right and left. The soil in the whole of this course is formed from the *debris* of the sandstone rock. It is of a light red colour and very dry, imparting rather a pleasing character to the aspect of the country, as well from its own sensible qualities as the vegetable productions it affords.

It appears admirably fitted for the culture of the vine; and should this ever be attempted on a great scale in India, perhaps no better situation could be selected for the purpose, than at the bottom of these sandstone hills in Bundlecund. Near the village of Cuckurettee,* a slight descent occurs; and we again enter upon an extensive plain, whose soil resembles, in some degree, that of the country below the

* Sp. 13 to 15.

Ghaut. Here for the first time, traces of *limestone* are discernible. These increase as we advance, and bring us at length to the great calcareous formation, at the military cantonment of Lohargong.* The first intimation I had of this new field of geological research, was the discovering several species of shells on the banks of a nullah at Cuckurettee, from which I inferred the near vicinity of calcareous rock; as it has been observed by naturalists, that the Testacæ are only met with in soils abounding in this elementary earth. Between Cuckurettee and Lohargong, pieces of rock are found at the surfaces, *striated* in an uncommon manner, and disposed into very thin layers. It appears to be a mixed formation of *sandstone* and *limestone*, the latter predominating; but whether it is extensive or not, I am unable to say, as the masses were quite solitary and detached, nor did I observe any projecting from below the surface.

At the cantonments of Lohargong the calcareous rock shews itself decidedly, and impresses a striking character on the country around.† It is quite near the surface, and in many places even forms it, having no earthy covering whatever. It is evidently a secondary formation, and as I afterwards ascertained, one of considerable extent. In a journey which I made from Saugor, I could perceive indications of it six or seven miles to the westward, and in the other direction it is found in combination with clay schists, as far the bottom of the Kopah hills,‡ distant twelve miles from Lohargong. This rock is not distantly stratified, (as far as it was possible for me to observe,) but lies on the same general level with the plain, having its denuded surface convex or slightly rounded off. It possesses great compactness, and exhibits no signs of disintegration. On the contrary, exposure appears to harden it, by communicating to the bare surface a sort of semi-crystaline, or *stalagmitic* crust.

From this arises I conceive the bleakness, and inhospitable character that pervades the district, the ground being little cultivated, and bearing only a *reed-like* grass. By reducing the lime to the quick state, and mixing it with the neighbouring soils, some improvement might probably be effected; and at all events, as far as a horticultural experiment may afford evidence, it seems worthy of trial by the residents on the

* Sp. 13 to 15. † Sp. No. 15. ‡ No. 16 and 17.

spot. This calcareous rock is of a formation posterior to the sandstone, and it is not improbable, rests upon the latter.

Casting our eye over the plain here, and surveying the hills that rise on each side, in a manner surrounding and enclosing it, we naturally conceive the idea of an immense basin that had at one time been filled with water, and formed an extensive lake. Some river, we may suppose, had burst through the hills to the south, and diffused its waters over the plain. These, as they gradually accumulated, would at length equal the level of the range on the northern side, and force a passage to the country below.

We should thus have a lake, like that of Geneva, with a river entering at one side, and passing out at the other. In process of time, the lake filling up by the deposit of alluvium and animal recrement, a contracted channel only would be left for the stream to flow in; while the earthy contents of the basin would gradually acquire the form and solidity which they now possess. What the mere aspect of the country suggests, may be said to receive some degree of confirmation from the circumstance of the Kane actually following the course here described. It issues from the hills to the south of the plain, and descends over the rocky barrier on the opposite side, hollowing out a channel in the stone as it proceeds, and shaping it into every variety of fantastic form. These *falls* of the Kane, as they are called, are situate a few miles off the direct route from Lohargong to Saugor, and distant about two marches from the former. They are well worthy the notice of the passing stranger, on account of the singular forms presented by the rock which receives the river, and conceals its course for many miles; the bed of the stream above the falls also abounds with beautifully variegated pebbles which admit of a high polish, and are much sought after for ornamental purposes.

The pure calcareous formation at Lohargong, succeeded by a scissile rock, is apparently consisting of argillaceous sand, mica and lime, and may be termed a *sandstone slate*. It divides with great facility into thin laminæ, and has a regular horizontal stratification, as is well displayed at the ford of the Kane near Kopah, where both banks of the river are composed of it. The only effect I observed this rock to have on the soil, was to render it less pervious to moisture; and thereby to cause the water to stagnate on the surface in the form of marshes and

shallow pools, which were more general here than in the preceding district.

After fording the Kane, here about hundred feet wide, we reach the village of Kopah, and enter directly on the range of hills forming the southern enclosure to the Lohargong basin. These are of various heights, but though less striking in their aspect than the range of the opposite side, they often afford the most beautiful and romantic prospects. They are entirely composed of sandstone of the same general characters as that so often alluded to. I picked up some specimens with dendritic impressions on the surface,* and occasionally found a mass of a different shade of red marked with white dots,† but these varieties seemed to be quite accidental. The strata were horizontally disposed, with the exception of one or two points, where they shewed considerable dip. Many ferruginous pebbles are met with, which appear to contain a larger proportion of iron than the gravel at Punnah. They are of the same essential characters, however, and only differ in that particular in being rather larger. On the hill immediately above Bellary, they are found united together in great masses, exceedingly compact, and apparently quite indestructible by the operation of the elements. From Kopah to Bisseinee is a distance of eighteen miles; from Bisseinee to Jyenuggur ten or twelve; and from this last place to Bellary as much more. The whole of this tract is hilly, and presents nearly the same general features throughout. We cross many clear running streams with rocky beds, ascend and descend moderate elevations, and between these, occasionally pass over a grassy plain. Around Jyenuggur the country is cultivated, and a patch of corn may now and then be met with in the early part of the route from Kopah, but with these exceptions, it is a continued jungle all the way to Bellary. On descending to this plain, the country again opens to the view, and a large plain with trees scattered thinly over it is seen extending in all directions. Having travelled by night from Bellary to the next stage, Koreah, I could not observe the appearance of the intermediate country, which was nearly as flat as the low country in Bundelcund. Between Koreah and the town of Sehorra, we find a new formation altogether, consisting principally of quartz. Some of the rocks are

* No. 18. † No. 19.

pure quartz, and disposed in vertical strata. Others have a peculiar striped arrangements in the mass, and in colour, lustre, and compactness, are not unlike the limestone of Lohargong. On arriving at Sehorra, I found these two rocks composing a small hill on which the fort or *gurree* is built. They appear to be primitive blue slate and quartz lying in opposition,* and in almost vertical and very thin strata, each layer not exceeding four inches in breadth. In several of the schistose strata, the stone has metallic lustre, and may with ease be reduced to powder. The quartz shews nothing peculiar; it lies close on the slate in continuous strata, and veins or thin laminæ may be observed intermingling with schistus. It bears, however, but a small proportion to this rock. In some specimens, the slate is striped with variously coloured materials differing in hardness. The town or village of Sehorra, where these rocks are met with, is prettily situated on two or three small gradually rising eminences, having a good deal of open grass glade, terminated by mango groves, in such a manner as to give to the whole the air of an English scene. The soil of the district around is of the same black colour as that of Bundelcund, but more clayey. It is extremely fertile, and the appearance of the surface at the time I passed, indicated that great care was bestowed on it by the ryots. For miles to the south and west, not a spot could be perceived which was not cultivated, and laid out in square pieces, with an intervening low mud dyke, similar to the paddy fields of Bengal. Rice too appeared to be a common crop here.

A few miles from Sehorra, we cross the Hirn, a stream of considerable width which falls into the Nerbudda, a little to the westward. The bed is not rocky like the Kane at Kopah, but formed entirely of sand without any gravel or pebbles. At a sweet little village named Gosulpore, which rises out of the surrounding miry soil, like an *oasis* from the desert, we again meet with large masses of the ferruginous concrete.† It is here more decomposed than on the hill above Bellary, and the ground on which the village stands, has evidently been formed from its *debris*. The natives, I was told, reduce the rock to the metallic state, and in the neighbouring town of Punnahghur work it very extensively; but not being aware of

* Sp. 20. † Sp. 22, 23.

this at the time of passing through the place, I could not make any enquiry as to the mode of accomplishing the reduction. I should reckon it of very difficult fusibility, with all the assistance which art can bestow. In the dark clay soil around Punnahghur is interspersed a good deal of the well-known calcareous concretion, termed kunkar by the natives. It does not seem to be so pure as that found on the banks of the Ganges, but contains a greater mixture of argillaceous earth. All these combinations of lime with the other elementary earths, are of a secondary formation, and are continually going on in such soils as abound in the former. It is not easy to say, how the process of union takes place, but it would appear to be dependent on the alternate action of the sun's rays and moisture, and to resemble very closely chemical, or electric attraction, as influenced by similar means. We meet with nothing like this calcareous concretion in the soils of Great Britain, as far as I am aware of, and whatever the cause may be which produces it, we may reasonably conclude, that its operation is limited to the hotter regions of the globe.

Between Punnahghur and Jubbulpore, we cross a small river named the Periot or Praca, (as laid down by Arrowsmith,) the bed of which abounds in every variety of agate and siliceous pebbles.

Near Jubbulpore is a low ridge of granite rocks,* in general qualities resembling that of Bundelcund, but approaching more to the gneiss formation, and at present undergoing a rapid decay. The whole district here is rocky, and presents a fine field to the geological enquirer; but my short stay only permitted me to give a cursory glance around the cantonment. Directly to the south of these, there is a formation of *old red sandstone* that appears to have been extensively quarried, and exhibits the peculiarity of being arranged in vertical strata, contrary to the usual position of this rock. A large mass of a whitish clay rock, containing quartz pebbles, forms the base of the hills to the east of the plain. It has been washed down by rains to powder, and formed anew into a boulder or cake at the surface. It probably has been formed originally from the disentegrated felspar of the neighbouring primitive rocks. The ridge lying over it, to the north and east, presents the primitive outline, and I concluded, was composed of similar granitic blocks to those

* Sp. 34, 35.

I had observed on approaching the town from Ramnughur. At Jubbulpore, we may be said to enter upon the extensive valley of the Nurbudda, the river being distant about four miles. It is a clear mountain stream with a rocky bottom, in width here not much exceeding the Kane, but greatly deeper at the time I crossed it in the month of October.

The rock of Tetwarra Ghaut, judging from detached pieces, seems to be a species of trap, and lower down the river, I was informed, passes over a formation of primitive limestone. Some blocks of this marble I have seen. It is of a pure white colour and close structure; and for all the purposes of the statuary might be reckoned not inferior to the celebrated Parian or Carrara. The natives, aware of its excellence as a material for sculpture, employ it in making images of their gods, and various ornamental appendages to their temples.

Report made by J. Mohl, *in the General Meeting of the Asiatic Society of Paris, 31st May,* 1841, *on the labours of the Committee during the six last months of* 1840, *and the six first months of* 1841, *translated from the French. By* Dr. E. Roer, *Librarian to the Asiatic Society of Bengal.*

Note by the Editor.—The publication of the following article, in which allusion is made in much too flattering terms to myself, might be considered presumptuous, were not my readers apprised of the feeling with which I peruse this complimentary notice. It is a just acknowledgment of the talents, the industry, and research of my contributors, and it is in this character only that I lay it before them. This Journal is solely dependent for its name upon those who contribute to it, and it will be gratifying to them to find, that their support has not been unattended by the applause of men of the highest literary character in Europe, recorded in the proceedings of a Society, which ranks among the most eminent of the Western world.

Though the past year has not been marked in the annals of your Society by any peculiar event, yet it must be considered as a fortunate one, as it has afforded a slow, but constant increase of your resources, relations and labours, the most evident sign of the life, and most certain presage of the continuation of a Society. Your Journal has been regularly continued, and has been the store-house of numerous labours. The contribution of memoirs, received by your Committee of the Journal,

has been greater than usual, so that it will soon become necessary to increase the size of your periodicals, to meet the activity of the members of the Society. We ought annually to have three volumes of the Journal, and one volume of the Collection of Memoirs, and though the resources of the Society do not admit our doing so at present, we may hope to attain this object hereafter.

The Committee would have desired to lay before you the first pages of the Voyage of Schulz, but could not command time. You will moreover observe, from the account which is to be given to you of the state of your finances, that the printing of this work, too long time already postponed, does not admit of any further delay. The great expences we defrayed for the printing of the Chronicle of Kashmir and the Geography of Abulfeda, are covered by the kind assistance of M. Villemain, Minister of Public Instruction, and the resources of the current year will allow us to send to the press the Voyage of Schulz.

The Society has sustained severe losses during the past year, especially among the foreign members. Mr. Gilchrist died on the 8th January at Paris. Born in Scotland in the year 1759, he passed a part of his early life in India, studied afterwards medicine, embarked as ship-surgeon to Bombay, entered there the service of the East India Company, and was transferred to Calcutta. He devoted to the study of the Hindostani, which he acquired with rare perfection, living for some years in a Mahommedan family. His systematic mind suggested to him the idea of forming that dialect into a language, which in Dehli and Lucknow had gained a great elegance as the language of conversation and poetry, but which in other parts of India, like the Lingua Franca, fluctuated between the Persian and the provincial dialects of the Hindus. He fixed the Hindostani Grammar, published a very good Dictionary, and translated a number of English works into that tongue, to furnish to its students works in prose, which were entirely wanting in the Hindostani literature, by which he rendered a signal service to the East India Company, giving a common language to their army, and the means of its successful study to their officers. Lord Wellesley made him Professor at the College of Fort William, where he had many pupils to attend upon his instructions. He afterwards retired to Edinburgh, where he established a bank, and some time later to London to

resume the teaching of the Hindostani, and he lastly repaired to France, where he was occupied to his death with his favourite theory of an universal language. He was rather distinguished for the activity than for the exactness of his mind, and for an ardent character, which threw him during his whole life into endless literary and political disputes, though he had a large fund of benevolence.

Another very distinguished member, the loss of whom the Society has to complain, is, Monseigneur J. L. Taberd, Bishop of Isauropolis, Apostolic Vicar of Cochin-China. Born at Saint Etienne in the year 1795, he took orders in 1818, and went two years afterwards as Missionary to Cochin-China, where he arrived in the year 1821, just at the moment when the position of the French missions in that country became involved in difficulties. The Archbishop of Adran, who in Cochin-China had exercised an almost royal power, expired, when the reaction on which the Anti-French and Anti-Christian party a long time since contemplated, forthwith broke out, and thence continued to rage with increasing fury until this day. Under these difficult circumstances, M. Taberd was elected in 1823, Superior of the Mission, and in 1827, Bishop of Isauropolis, and Apostolic Vicar of Cochin-China. The persecution having dispersed the Bishops of Cochin-China, he was obliged to remove to Siam to be consecrated. The king Ming-Menh, however, by fixing a price during his absence on his head, prevented him from re-entering his diocese. Then taking refuge to Pulo-Penang, he founded the Catholic College for the missions of Transgangetic India, and went from thence to Calcutta to print his Cochin-China Dictionary, the fruit of the accumulated labours of a large number of missionaries, which was completed by himself. The generosity of the Governor General of India, and of the Protestant Missionaries at Seramporc furnished him the means of accomplishing his great undertaking. Some time afterwards, he was elected Apostolic Vicar of Bengal, but he could not discharge the functions of his new appointment, as he almost suddenly died on the 31st July 1841, and as he had not previously received his definitive nomination.

The year, the labours of which occupy us, has not been very favourable to Oriental studies, especially in Asia, where war has paralysed so many undertakings. These circumstances indeed will latterly turn out to the benefit of Oriental literature in Europe, because the more and

more increasing political importance of Asia must naturally claim the serious attention of the European nations; but for the present, the literary progress in the small number of places where it has been developed, has been retarded. The presses of Constantinople, Teheran, Cairo and Canton, have produced nothing worthy of remark, and those of India, though not altogether unemployed, have been less active than formerly.

The Asiatic Societies have everywhere continued in their efforts to make known the discoveries in the languages and histories of the East. The Asiatic Journal commenced by the late Mr. J. Prinsep, is now edited by Mr. (Henry) Torrens, who conducts it with great zeal and ability. The Society of Madras continued its Journal with much regularity. The German Oriental Journal commences a new series, and the excellent Journal of the Geographic Society of London, becomes more and more a powerful ally to the collections, specially designed for the East. The number of these collections has been augmented by the Orientalia, published by Messrs. Juynbull, Roorda and Weijers. The first volume of these collections has appeared in Amsterdam; its destination is to become the organ of the excellent school of Leyden, which displays in its Asiatic studies, the same spirit of learning and of conscientious research, which has for so long a time distinguished the classic Philology of Holland. The Orientalia do not exclude any department of research concerning Asia, but they are more especially destined for the Semitic languages and literature. The first volume contains a Posthumous Memoir on the collective Nouns of the Arabs by Hamaker, and a Poem not previously published, of Montanebbi, edited and translated by Juynbull, and a continuation of the Catalogue of the Oriental Manuscripts of the Library at Leyden, by M. Weijers. I should perhaps mention also as a new Asiatic Journal, the one published by the Society of Jesu in Lyon, under the title of "Lettres du Madure," of which six numbers have appeared.[1] It is composed of Letters of the Missionaries of this order in the South of India. Though its chief end is to give an account of the state of that mission, yet it contains a mass of details on the customs of the Hindoos, and would undoubtedly find its place in the libraries of the learned, if the Society were to allow the sale of it.

Two new Asiatic Societies have been established during the past year, one in Paris, "La Société Orientale," whose principal object is

1. Lettres des nouvelles Missions du Madure. Lyon, 1840, in 8vo. Vols. I. and II.

to publish the monuments of art of the Asiatic nations, the other in London, under the name of "Society for the Publication of Oriental Texts." It is now constituted and has commenced its labours. It forms the necessary complement to the Committee of Translations, and we sincerely hope, that it may be favoured with the support of the learned men and of public institutions; which is so necessary for the execution of its great and difficult enterprise, as there is no chance of its becoming popular. It cannot be too often repeated, that the publication of the most important Oriental manuscripts is the greatest and most urgent want of our studies. Only when the critical labours of the learned have passed over the master-pieces of every literature; when the press has facilitated the material use of books, and obviated the immense loss of time, occasioned by the reading of manuscripts; when it has diffused to all corners of Europe the materials which must now be searched for in some collections of manuscripts, only then can European intelligence really penetrate the East, and by disengaging the historic truth from the thick layer of fables and contradictions involving it, reconstrue the history of mankind. The accomplishment of this object is indeed far distant, yet the way to attain it is distinctly pointed out, and every year we advance a step to it.

The number of catalogues of oriental manuscripts in the European libraries which are being published or prepared, may be considered as a very good idea for this purpose. The Bodleian Library at Oxford has a short time since finished the publication of its catalogue, fifty years ago commenced by Uri, and finished by Nicoll; it has been published by Purey.[2] It is a great and beautiful enterprise, worthy of this celebrated library. Mr. Prinsep, a short time before his death, edited in two volumes, the Catalogue of the Manuscripts of the Asiatic Library of Calcutta. Mr. Fleischer, to whom we already owe the Catalogue of the Oriental Manuscripts at Dresden, has also published that of the Library at Leipzig.[3] Mr. Brooset has edited in Petersburg the Catalogue of the Armenian Library of Edchmiadzin.[4] For a long time it was the regret of

2. Bibliothecæ Bodlianæ Codicum Manuscriptorum Catalogin, confecit Nicoll edidit Purey, in fol. Oxford, 1835.

3. Catalogus Librorum Manuscriptorum Bibliothecæ Senatoriæ Lipsionsis, ed. Neumann. Codices Orientalium Linguarum Descripserunt; Fleischer et Delitih, 1838, in 4to.

4. Catalogue de la Bibliotheque d'Edchmiadzin, publié par M. Brooset. Saint Petersbourg, 1840, 121 pages.

those who took an interest in the Armenian literature, that the treasures contained in the Library of the principal place of the Armenian hierarchy, were inacessible to Europeans. At last the influence of M. de Flahn, Imperial Commissioner of the Caucasian provinces, has obtained from Catholicus the catalogue of his library, and the Academy of St. Petersburg hastened to communicate it to the public. We there may observe, that the disasters which during so many centuries oppressed the Armenian nation, equally retarded the progress of their literature; for the library of Edchmiadzin contains only 181 manuscripts, among which there are a hundred, which treat about history or geography, while the others are works on theology or scholastic philosophy. M. Schott has printed the catalogue of the Chinese books of the Library in Berlin, which is a continuation of the catalogue presented by M. Klaproth.[5] M. De Hammer edited the catalogue of his splendid collection of Arabian, Persian and Turkish manuscripts, and also that of the manuscripts of the Ambrosian Library.[6] M. Fluegel has likewise inserted in the annals of Vienna, a list of new acquisitions of Arabic manuscripts, which the Royal Library of Paris has made during the last years. The catalogue of the oriental manuscripts of Tubingen is published by M. Ewald,[7] and M. Dulaunier has inserted in your Journal the list of the Malayan manuscripts of the Asiatic Society of London. Lady Chambers has given to the press the catalogue of the magnificent collection of Sanscrit manuscripts, which her husband had made in India.[8] This catalogue is one of the last works of Rosen, whom death has so untimely taken from the prosecution of his oriental studies. The Academy of Lisbon has been sometime occupied with the preparation of a complete catalogue of all the oriental manuscripts in the Libraries of Portugal, which is of an incalculable value to literature, as the long dominion of the Portuguese in various parts of the East must have enabled them to collect a great many manuscripts. The Academy of Portugal will honour your Society with the charge of publishing the

5. Verzeichnsis der Chinesischen und Mandschu, Tungusischen Bücher der Bibliotkek in Berlin, von Ed. Schott, 1840, in 8vo.

6. In the Wiener Jahrbuchern, and separately printed in a small number of copies.

7. Verzeichniss der Orientalischen Handschriften der Bibliotkek zu Tubingen, von Evald, 1839, in 4to.

8. Catalogue of the Manuscripts of the late Sir R. Chambers, with a Memoir by Lady Chambers. London, 1838, in fol.

catalogue. The British Museum, a long time since one of the richest depôts of oriental manuscripts, is about to publish the catalogue of its Syrian manuscripts, prepared by the late Mr. Rosen, and we dare hope, that this excellent institution will make known the rest of its treasures, which the want of a repository, as well as the existence of very annoying regulations, render of a difficult access. Lastly, your Society proposes to publish among the papers of Schulz, the catalogue of Arabic manuscripts relative to history, which are in thirty-two public libraries of Constantinople. It is extremely desirable, that not only large libraries, but also those which possess only a small number of manuscripts, as well as learned men, following the example of Sir W. Ouseley and M. De Hammer, print their catalogue for the purpose; that every one may be able to know what is to be found in Europe, and accordingly to guide himself in his publications, and especially, that Europeans settled in the East, in full knowledge of the existing wants, may procure manuscripts to complete the collections of the Western world, and may save important works from destruction. A vast number of works, which are considered as lost, are undoubtedly extant in some obscure libraries of the East, but we must hasten to obtain them, as every thing conspires to accelerate their destruction. Everywhere in the East, excepting in China, learning is disappearing ; manuscripts are no longer copied, and the libraries are dispersed by the accidents of war, and by the poverty of families. In looking over Musulman manuscripts, every one must have observed the seals of some member of a family effaced, which has become too poor as to retain the books, inherited from its ancestors, and is too proud as to let it become known, that it was obliged to sell them. The introduction of the press also contributes to the destruction of manuscripts by decreasing their prices and lowering the respect paid to them at former periods. It is, however, still time to save many of these treasures, and the publication of the catalogues of the European libraries, by directing the purchasers, must greatly contribute to the accomplishment of this purpose.

We will now state the progress which has been made in the literature of the different nations of the East. We observe, that the Arabian literature has been most actively cultivated. The Committee of the Oriental Translations of London has published the first volume of the History of the Arabs in Spain by Makkari, translated and accom-

panied with notes by M. Pascual de Gayangos, an erudite Spaniard.[9] Ahmed-al-Makkari-al-Telamsani is a Mogrebin author. Born about the end of the 16th century, he died at Damascus in the year 1631. After having composeda very detailed biography of the celebrated and learned vizier of Granada, Mohammed-Ibn-al-Khatib, he added to it in the form of an introduction, a General History of the Arabs in Spain, from the conquest to their final expulsion. The importance of this work has not escaped those authors who have occupied themselves with this part of the history of the Arabs, and Cardonne, Conde, as well as Shakespear, Reinaud, Lembke, and Fauriel, have made an extensive use of it in their works. It was of course designed for the study of Spanish orientalists; the more so, as Makkari is among the small number of authors who embrace the whole duration of the dominion of the Arabs in Spain. The first volume of M. de Gayangos' translation, which is a very considerable work, is now in your hands, and must be received with gratitude by all the persons who devote themselves to the history of the Arabs. The notes, which by the bye are of very unequal merit, are very numerous with regard to Spain, and contain extracts from a great number of Arabian historians. M. de Gayangos does not exactly give a translation of the original work; he transfers some chapters to introduce a more logical order into the narrative; he omits the life of the Vizier, of which he, however, retains extracts for illustrations; he excludes the fifth chapter, containing the lives of the Spanish Musulmans who travelled to the East, and also the 7th, which gives extracts of the poetry of the Arabs in Spain. It is difficult to judge according to a general principle about this system of translating Oriental works; it is certain, they often contain passages of little interest for the European reader, and relate the facts not in a very natural order; moreover, there is a rage among the Arabian writers, especially at the decline of their literature to quote verses, which is often very annoying for the translator, and of little benefit for the reader, and we may easily understand a doubt of the propriety of translating the whole, yet mature reflection will convince us, I think, that the system of complete translations involves into less difficulties, than that of incomplete ones. By this last method indeed, a work is produced much more agreeably to the general reader; those,

9. History of the Mohammedan Dynasties in Spain, from the text of Al-Makkari, translated by Pasc. de Gayangos. London, 1840, in 4to. vol. i.

however, who would use it for particular researches, cannot consult it but with mistrust, not knowing, whether the translator have not omitted the very facts which they are mostly anxious to obtain. Are there no readers who may regret that M. de Gayangos has rejected the first chapter? For the Spanish Musulmans who travelled in the East, undoubtedly were the most eminent men among their nation, so that their lives must naturally excite our curiosity.

The first book of the Kitab el Aghani, has been edited by Mr. Rosegarten,[10] and the second is nearly completed. He has accompanied it with the first part of a very curious dissertation upon the music of the Arabs, in which he endeavours to prove, that they borrowed their music from the Greeks. Whether his assertion be founded or not, will be ascertained by the end of the dissertation, which is to appear with the next book of the text, when the reasons adduced for its validity, will enable the reader to form his own judgment. Great care is bestowed on the text of the Aghani, and there is perhaps no other Arabian work which so much demands it as this collection of the lives of the poets, as it is one of the most curious documents of the political and literary history of the Arabs; for it is generally known, how much poetry had penetrated their whole life, and how almost all the information we have of their social and moral condition before Islamism, is derived from their poems and the commentaries on them. Mr. Lane has completed his translation of One Thousand and One Nights,[11] illustrating it to the end with notes, derived from so intimate an acquaintance with modern Egypt, as perhaps no European has ever possessed. The importance of these fascinating tales in oriental literature is incalculable; for they are even at our days the only work of Asia which has become perfectly popular, and these very tales have surrounded it in the eyes of the public with that poetic glory, which inspires so many with the curiosity of studying more deeply the literary treasures of Asia. It is especially this consideration, that every thing contributing to increase the attractions of this book, becomes important for oriental studies, and we must feel indebted to Mr. Lane for his having so well attained this object.

10. Alii Isfahanensis liber Cantilenarum Magnus. Ed. Rosegarten. Gripesvaldiæ, 1840 in 4to.

11. The Thousand and One Nights, a new translation from the Arabic, with copious notes, by E. W. Lane. London, 1839-41, 3 vols. in 8vo.

Mr. Veth has published at Leyden the first half of the text of Lobbal Lobab by Soyouti.[12] It is a Dictionary of patronymic names, and of others under which the Arabic authors are much more frequently quoted than under their proper names. The confusion under which the Arabs labour themselves to identify men known under different names, has induced them to prepare dictionaries for obviating this difficulty. Samani in the sixth century of the Hegira has published one, in which he does not only explain the sense and origin of these names, but also mentions with regard to every word the true names of the authors who have had them. This work was abbreviated in the succeeding century by Ibnal-Athir, and this extract again shortened by Soyouti. The work of Samani is at present unknown, if not lost, and the extract of Ibnal-Athir is only known by the specimen given by Mr. Wustenfeld, according to an incomplete manuscript of Gotha. Under these circumstances, Mr. Veth has resolved on publishing the text of Soyouti, who has preserved the definitions of the names, omitting, however, the enumeration of the authors who have borne them, and also the literary details his predecessors had added. The work of Soyouti, is therefore, far from containing all we would wish, but the excellent edition by Mr. Veth is nevertheless an acceptable present, not only because the Lobbal-Lobab explains the often bizarr surnames of the authors, but especially because it contains a great number of names of places, which we in vain are searching in the most complete geographical treatises. It is here perhaps not out of place to call the attention of Oriental travellers to the importance of the treatise of Samani, entitled "Fi'l-Ansab," the discovery of which would much contribute to the progress of Arabic bibliography.

This brings me back to two editions of Ibn Khalli-kan, which at this moment are printing at Göttingen and Paris. Mr. Wustenfeld has published the 7th book of his, while Mr. Slane has finished the excellent text he is editing.[13] A pamphlet has been lately published by Mr. Cureton, on an autograph manuscript of Ibn Khalli-kan, discovered by

12. This work has appeared in the form of an academical thesis under the title "Specimen Litterio Orientalibus exhibens majorem partem libri. As. Soyouti de nominibus relativis inscripti ——— proponit Johan. Veth. Lugduni Batavorum, 1480 in 4to.

13. Kitab Wefayat Al-aiyan; Vies des Hommes illustres de l'Islamisme en Arabe, par Ibn-Khalli-kan, publiées par M. le Baron MacGurkin de Slane. Paris, Fermin Didot, 1838-40, in 4to. cahiers i. iv.

him, and he would have fain entrusted it to Mr. Slane, as it seems to contain the second redaction of that work.

Mr. Freitag at Bonn, advertises the third volume of his Proverbs of the Arabs; the two first ones contain the classic work of Meidani, which the third volume will complete, with additional proverbs, not mentioned by this author, and which Mr. Freitag has for the greater part taken from an unedited work of Scherefeddin, and from the proverbs of the Bedooins by Mr. Burckhard. The work will be closed by very copious tables of contents, to enable the reader to find the proverbs which the Arabian authors often indicate by a single word.

Mr. Sprenger, under auspices of the Committee of Translations, has edited the first volume of his English translation of the celebrated work of Masoudi, "The Meadows of Gold."[14] Masoudi wrote in times most favourable for a historian; the Khalifat in the beginning of the 4th century of the Hegira had obtained almost its largest extension, the intellect of the Arabs was not yet put down by the grammar, the rhetoric, and the controversies of the sects, their genius was still stimulated by the remains of the ancient civilisation, and by the literature of the conquered nations, and the position of the Khalifat facilitated the most distant travels. Masoudi availed himself of all these advantages; his reading was immense, his travels uninterrupted, and very extensive. According to the custom of the learned men of his time, he has written on almost all subjects which then could interest Musulman readers; but for us his historical works alone are of interest. The first of his compositions is Akhbar-al-Zeman, an enormous work of at least twenty volumes; the second is the Kitab-al-Aouscth, being the complement to the Akhbar; and the third, the "Meadows of Gold," forming at the same time the extract and the supplement of the two others. This last work alone is known in Europe. Written with a singular want of order and method, it contains the most curious information on a great number of subjects. Not being a mere compiler, as are most of Oriental historians, Masoudi made a great many personal observations and researches on subjects neglected by his predecessors. Mr. Sprenger has compared for his translation the manuscripts of Leyden, Paris, and London, and always added the Arabian orthography of the names, which is of great assistance

14. El Masudi's Historical Encyclopedia, entitled Meadows of Gold and Mines of Gems, translated by Aloys Sprenger, vol. i. London, in 8vo.

in the use of a work, abounding with names of men and places ; and he also joins to it a certain number of critical and explanatory notes. This work will require much more extensive commentaries, if the variety of subjects to which allusion is made by Masoudi, shall be elucidated ; but the first thing is a complete translation, and it is highly desirable, that Mr. Sprenger should continue his useful and excellent undertaking.

Since the conquest of Algiers by the French, the history of Northern Africa has become a subject of great interest, and we are presented in the past year with many works relating to it, and others we are promised, so that this portion of the history of the Arabs, about which we only possess the very imperfect labours of Cardonne, will soon be numbered with those best known to us. Mr. de Slane has published in the Asiatic Journal, the history of the first Masulman dynasties in Africa, and has advanced it to the Aglabites, where Mr. Noël Desvergers takes it up in a work entitled " Histoire de l'Afrique sous la dynastie des Aglabites, et de la Sicile, sous la domination Musulmane."[15] He gives the text and translation of the narrative of Ibn Khaldoun, accompanying it with notes, principally taken from Nowaïri and Ibnal-Athir. The Aglabites, after having governed the eastern part of the coast of Barbary during the whole third century, were dispossessed of it by the dynasty of the Fatimites, which in their turn for nearly three centuries possessed the greatest part of Moghreb. Mr. Nicholson[16] has edited at Tübingen, an English translation of the history of the establishment of this dynasty, taken from a manuscript of the library at Gotha, erroneously attributed to Masoudi. The work of the unknown writer seems to have served as basis to the narratives, as well of Nowaïri as of Ibn-Khaldoun, and he enters into more details than these two authors have done on this great event of the history of the Khalifat, an event which threatened the existence of the Arabian empire, and to which Europe perhaps owes its escaping from a Musulman conquest.

The French government, well aware of the importance of the history of North-Africa, has for some years made efforts to procure all the means for elucidating it. With much propriety it has attached a great value to that portion of the great work of Ibn-Khaldoun, which under

15. Paris, chez Didot. 1840, in 8vo.

16. An account of the establishment of the Fatimite Dynasty in Africa, by J. Nicholson. Tübingen and Bristol, 1840, in 8vo.

the title of the "History of the Berbers," treats all that during the middle ages refers to the Moghreb. It has charged Mr. de Slane with the publication of this important work, which will be printed at Algiers, and form two large volumes, containing the text of Ibn-Khaldoun, a French translation, and a historical commentary. The editor has succeeded in collecting a sufficient number of manuscripts, and the unwearied kindness of Mr. Weijers, has placed at his disposal the manuscripts of the library of Leyden. The printing of this work has commenced, and from all circumstances we may hope, that this excellent undertaking will be brought to a close as speedily as possible.

Mr. Cureton, conservator of the manuscripts of the British Museum, has commenced printing the History of Religions by Scharistani, written in the first years of the sixth Hegira. The labours of Pococke and Hyde had a long time since spread the fame of this work, which successively treats respecting the orthodox and heretic sects of the Musulmans, the philosophic schools, the Persian and Sabean sects, the superstition of the antient Arabs, and especially contains on these last subjects a mass of facts, which elsewhere in vain are to be looked for. It is one of those Arabic works, which in our time, when the history of religions has become the object of so much research, will excite the most vivid interest of the public, and we cannot help congratulating the Society for the printing of Oriental texts, to have selected this as their first publication. As Mr. Cureton has no intention of giving a translation, it is a fortunate circumstance, that Mr. Schmœlder at Bonn has been since some years occupied in preparing a translation and edition of the same work, and it is possible, that the undertaking of Mr. Cureton, from which he may derive so many facilities for his translation, may induce him to relinquish the publication of the text. Mr. Schmœlder is eminently qualified for a labour of this kind by his studies of the philosophy of the Arabs, the first result of which he has given in his "Dommenta Philosophiæ Arabum, Bonn, 1836," promising at the same time a new work of the same kind, which is to contain some memoirs on the philosophy of the Arabs, preceded by a treatise of Ghazali. This labour has met with the approbation of the Academy of Inscriptions, which has been recommended to the Minister of Public Instruction, to add it to the number of works encouraged by the French government.

Mr. Dernburg is preparing an edition of the Tarifat of Djordjani, together with a French translation and a commentary. The Tarifat is a dictionary of the technical terms of Arabic Grammar, Philosophy, and Theology, and you all know, what value Mr. de Sacy attached to this work. Mr. Dernburg takes as basis of the redaction of the text, the edition of Constantinople compared with the manuscripts of Paris. I should besides mention a work of Ibnal-Beither on the medicine of the Arabs, which Mr. Sortheimer is translating into German.

The Semitic dialects have furnished this year a subject of new and curious studies. Every body knows, that on ascending Mount Sinai from the Gulf of Suez, one may follow some collateral valleys, intersecting the foot of the mountain, which exhibit on the walls of the rocks they traverse, inscriptions not yet decyphered. One of these valleys abounds so much with them, that it has received the name of "Wadi Mokatteb," the valley of inscriptions. A great number of them have been published in different works, and Mr. Beer at Leipzig, who has already distinguished himself in other branches of oriental paleography, has undertaken the task of decyphering them. He has printed the first part of his labours, forming the third part of his "Studia Asiatica,"[17] and the conclusions at which he has arrived are, that these inscriptions date from the fourth century, that they are written in one of the Semitic alphabets and dialects, and that they are the work of the Nabatenés.

With regard to Persian literature, only one work referring to it has become known to me; viz. Sadi's Galistan, translated into the German, by Mr. Wolff, in a most elegant manner.[18] Other works are commenced or advertized. Your associate, Mr. Troyer, has under the press an English translation of the Dabistan, a work which has a long time excited the curiosity of the learned. It is a history of religions, written in Akbar's time, by a Guebre, Mobed Shah, who turned Musulman. The intention of the author appears to have been to furnish to Akbar, a pretended historical basis of the religion which this emperor had invented, and which he was desirous to introduce. For

17. Studia Asiatica, edid. Beer fasc. iii. Lipzig, 1840, in 4to. The first two numbers of this work have not appeared, and the author unfortunately died since the publication of it.

18. Sadi's Rosengarten, ubersetzt durch Dr. Ph. Wolff. Stuttgart, 1841, in 12mo.

this reason, the author commences with a very long chapter on the religion of the Mahabadians, which is a mere web of incoherent fables. He then thoroughly enters into his subject, treating on the religions of the Persians, Indians, Jews, Christians and Musulmans, on the Illuminati, the Sofis, and some other sects. This work cannot be used without a certain mistrust; it contains, however, on those obscure sects an infinite mass of details, which will serve to complete the history of religions. Sir W. Jones, I think, first mentioned this work. Gladwin published in the "New Asiatic Miscellany," its first chapter, together with an English translation. Leyden in the 9th volume of the Asiatic Researches, translated the chapter on the Illuminati, and the text of the whole work was published at Calcutta in 1809. The Committee of Translations charged Mr. Shea with the translation of it; but as he died without having made a considerable progress in the work, Mr. Troyer has engaged to complete and to publish it.

The English Society for the publication of Oriental Texts, advertises three Persian works, of which it prepares editions; viz. Khamschi Nizami, that is, the collection of five poems, half epic, half romantic, by Nizami, of which as yet only one, the Secander Nameh, is printed; the second is the Youssef and Zuleikha by Furdusi, which Mr. Morley has undertaken to publish. It is Furdusi's last work, written during his flight. It was considered as lost, but was found again a few years since by Mr. Macan. The third, a part of the great work of Raschid-eddin, is the History of India. You know, that Raschid-eddin deposited copies of his work in a certain number of libraries, and Mr. Morley was fortunate enough to discover one of these authentic copies. He intends to publish that part of it which treats on the History of India, as it is one of those which are not met with in the manuscripts of Raschid-eddin in the libraries of the continent.

We have here the best oppportunity of mentioning a remarkable work, which is indebted for the new and important facts it contains to the Persian historians, consulted by the author; we allude to the History of the Golden Horde by M. Hammer de Purgstall.[19] It is well known, that the Golden Horde has reigned in Russia for more than two centuries, exercising the greatest influence on the formation and fate of the Rus-

19. Geschichte der Goldenen Horde in Kiptschak dar ist der Mongolen in Russland, von Hammer Purgstall. Pesth, 1840, in 8vo.

sian empire ; however, a detailed and special history of this important branch of the Mongol empire was required, and the work referred to, in which M. de Hammer displays his vast learning, has fully supplied this want. He does not only follow the History of the Golden Horde, from its origin to the destruction of the empire founded by it, but he also adds new and important facts on the general history of the Mongols, among which the reader will certainly distinguish the description of the organisation of the Mongolian court, forming the fifth book, and the collection of patent letters, addressed to a considerable number of Mongolian civil and military officers. The author, who intends to prosecute this subject, will soon publish a History of the Mongols in Persia, for which a long time he has been collecting materials.

Before leaving Musulman literature, I cannot omit mentioning the French-Turco Dictionary by Prince Handjeri in Petersburg, which will form three large volumes in 4to., and the first volume of which has appeared.

All persons, most advanced in the Turkish language, are unanimous concerning the great merits of this beautiful work, which is a complete translation of the Dictionary of the French Academy. It is more especially destined for Turks who are studying the French, while the Franco-Turkish Dictionary, which M. Bianchi is publishing in Paris, and of which the printing is nearly completed, appears especially to be destined for European students in Turkish.

In speaking of India, we have received the fourth volume of the Mahabharat, containing the end of the text of the Mahabharat itself, and the continuation of this grand epic, known under the title of Harivansa. We venture to hope, that the Asiatic Society has not relinquished the purpose of completing this work by an onomastic index, to facilitate the use of this immense magazine of Indian traditions.*

The Vedas, now very imperfectly known by the Memoir of Colebrooke, and the first volume of the Rigveda by Rosen, are at this time everywhere the object of the labours of Indian scholars. The Committee of Translations have accepted the offer of Mr. Stevenson of Bombay, to

* Such an index has been prepared. The Mahabharat is published by the Asiatic Society of Bengal, with the assistance of the printing fund allowed by the Government of India.

publish a translation of the Sama Veda, which in the ceremonies of the Brahmans, seems to occupy a similar place as the Mass in those of the Catholics. Mr. Wilson prepares for the same Society the texts of the prayers and hymns of the Yadyur-Veda. These hymns composent the real body of the Vedas ; they are, to say so, of a primitive formation, and give the first seeds by which the Indian race since that time has exercised such a great influence upon the progress of the human mind. Much later were added to the Vedas a certain number of Upanishads, which are in fact like so many appendices, some of them being commentaries of the hymns, while others contain a systematic explanation of the doctrines of the Vedas, the first result of the tendency of the human mind to reduce religious tradition to a system. You are aware, that Mr. Poley some years ago commenced a lithographed edition of the Upanishads, which he was unable to complete on account of his departure to London; but he is determined to resume his labours, and now advertises an edition of Vishadaranyaka, one of the Upanishads of the Yadyur-Veda. The print of this work is also commenced at the expence of the Oriental Text Society.

The Indian drama, to which so much attention has been attracted by the labours of Jones and Chezy, and especially of Wilson, has occasioned some publications. Prema-chunder, Professor of the Sanscrit College at Calcutta, has published a new edition of the Sakontala, which contains no other additions to the text than a Sanscrit translation of the passages written in Pracrit, and appears to be destined for the natives of Bengal. To judge by the adoption of Bengalee characters, Mr. Bœthlingk at Bonn, promises a new edition of the same drama according to the manuscripts of London, which considerably differ, and this in important passages from the text of Chezy. This translation is to be accompanied with a Latin translation and notes. Another drama ascribed, but probably erroneously as so many other poems, to Kalidasa, the author of the Sakontola, has been published at Bonn by M. Tullberg; viz. the Malavica and Agnimitra.[20] Text and variation only as yet appeared, but M. Kullberg promises likewise a Latin translation and notes. A third work, attributed to Kalidasa, the Meghaduta, of which Mr. Wilson had already published an edition, and a very elegant English

20. Malavica et Agnimitra, edidit Fr. O. Tullberg, Fascicular prior textum Sanscritumtenens. Bonn, 1840, in 4to.

translation, has been reprinted at Bonn by M. Gildemeister, who has added to the same volume a little erotic poem of the title "Sringari-Tilaka." Both texts are accompanied with a complete dictionary. Raja Kalikrisna at Calcutta, advertises an edition an English translation of Maha Nataka, that is to say, the great poem. It is a half dramatic narrative of the Ramayana, which is at present known in Europe by the short analysis only of Mr. Wilson. This work, of which the ape Honuman is believed the author, enjoys great popularity in India. Mr. Hœpfer has published at Leipzig a small volume, containing the first series of translations of Indian poems, the metre of which he imitates in German.

The Indian Grammar has been the object of some labours, of which the most important is the second volume of the edition of Panini, edited by Mr. Boethlingk,[21] and the tables, arranged by the editor, much facilitate the use of it. Mr. Hœpfer has published a dissertation on the infinitive in Sanscrit,[22] considered under the view of the comparative Grammar and of the Synthesis. Mr. Westergaard has edited the second part of his Sanscrit roots.[23] The progress of Indian literature since the print of Rosen's Radices, enabled Mr. Westergaard to extend the plan, and to fill out the sketch given by Rosen. Mr. Johnson lastly, has published in London the first volume of the Hitopadesa, together with a grammatical index of all the words. This book is destined for beginners.

The religious controversies, always disturbing India, which from the intercourse of the natives with Europeans had recommenced with renewed ardour, especially at Bombay, have caused some curious publications; I shall offer, however, a remark on only two of them. The first is an antient Sanscrit treatise under the title of "Wajrah Soutchi,[24] by a Buddhist of the name Aswa Goscha, who therein attacks the Brahminical institution of caste. Mr. Wilkinson, political agent at Bhopal, who discovered it, intended to print it as a work, attacking caste, but the Pundit Soobaji Bapoo, whom he employed for this purpose, requested his

21. Panini, 8 Bücher Grammatischer Regeln, horausgegeben von Dr. Boethlingk, 2 vols. in 8vo. Bonn, 1810.

22. Vom Infinitiv, besonders im Sanscrit, von Dr. A. Hoepfer. Berlin, 1840, in 8vo.

23. Radices Linguæ Sanscritae definivit, Nic. L Westergaard. Bonn, 1840, in 8vo.

24. The Wujra Soochi, or Refutation of the arguments upon which the Brahmanical institution of Caste is founded by the learned Boodhist Arhwa Gorhu. ch.

permission to add to it a refutation under the name "Tanka," also written in Sanscrit, and thus appeared this small volume in Bombay. The second theological publication is the Ta'limi Zerdusht, a (Mobed) Parsee Dasabhaï. This work, composed in the language of Guzerat, and printed in Bombay, contains a defence of Zoroaster's doctrines against the American Missionaries, together with a refutation of Christianity, in which he adopts the arguments of Voltaire against the doctrines of the Catholic Church.

When the progress of a science is very rapid, a scholar would not like to publish a general work to represent the actual state of this science at his own time. This repugnance is very natural, as we know that such a labour will be soon superseded, although works of this kind are eminently useful, not only for the general reader, but also for the learned to whom they represent the history of the former periods, and indicate the wants which they are called for to supply. This service has Mr. Benfey in Berlin, afforded to Indian studies, by selecting and combining the most positive information which we possess about the antient geography, history, and literature of India.[25] In this conscientious work, we observe interesting researches on the study of the antient navigation of the Hindus, on the importance of the study of Buddhism for the History of India, and we are sure, that every one, consulting this work, will derive great benefit from it.

Chinese literature has not given occasion to a great number of works. Mr. Pauthier has under the title of "The Sacred Books of the East," edited a large volume, containing a collection of works, on which the religion and legislation of some great nations of the East are founded.[26] In this volume are embodied the Chou-king, (according to) in the translation of Gaubil, revised by the editor according to the manuscript of Gaubil himself, the four Moral Books of Confucius' school, translated by Pauthier, the Laws of Menu according to the translation of Loiséleur, and lastly, the Korān, translated by your associate, Mr. Kasimirski de Biberstein. This work is destined to render some of the most fundamental works of the East more accessible to the public, while

25. Indien, von Th. Benfey. Leipzig, 1841, in 4to. partly taken from the Cyclopædia of Ersch and Gruber.

26. Des Livres Sacrés de l'Orient, traduits on revus et publiés, par M. Pauthier. Paris, 1840, in 8vo.

at the same time it affords the evidence of the interest the public have in such undertakings; for the translation of the Korān by Mr. Kasimirski which it contains, is already the second edition within a year, and the printing of a third one is commenced. Mr. Pauthier has also occupied himself with a new edition of the Moral Books of the Chinese, contained in the volume of which I am speaking, and moreover published the Statistical Documents on the empire of China, translated from the Chinese, (Paris, 1841, in 8vo.) They are taken from the official statistic, entitled "Tai-tsing-hoeitien," which give a detailed account of the state of population, and the revenue of each province.

Mr. Bazin advertises the speedy publication of a work, which will highly excite the curiosity of the public; viz. the complete translation of the Pi-pa-ki, a drama of twenty-four pictures, written by Kao-tong-kia, in the fourteenth century under the dynasty of the Youens.

Tsaï-yong is a historic person, who at the commencement of the third century of our era, was president of the tribunal of the historians. He is one of those *savans*, often presented to us in the history of China, who became martyrs to their patriotism; for not being allowed by the emperor to finish the history of the dynasty of the Hans, he died in prison of mental anxiety, arising from the frustration of his purpose. The Pi-pa-ka, however, not treating this catastrophe, introduces Tsaï-yong in his youth. The Chinese critics cannot find adequate language to praise the elegance and the varied merits of this drama, which in their eyes has no other rival than the Si-siang-ki, and they raise it even above this, as in the Pi-pa-ki they find with equal poetic beauties a more pure morality. Whatever value may be attached in Europe to the Pi-pa-ki, it must always be highly estimated, considered as a picture of the customs of the Chinese in the fourteenth century.

Round the four great literatures, the Arabian, Persian, Indian and Chinese, must be placed the literature of other Oriental nations, which have not become themselves centres of civilization, but borrowed their ideas from one or the other of those great nations. In them we must therefore not expect works, stamped with originality, which have made an epoch in the history of mankind. Nor may we hope, that a great number of learned men will cultivate them; but it is desirable that they may not be altogether neglected, and that the wants of government, of commercial transactions, the enthusiasm of the Missionary, or the zeal

of the learned, will gradually put them into fuller light, and give the historian access to the facts which may be derived from them, since almost each of those nations, according to the international influence it has enjoyed, is possessed of more or less important chronicles; most of them have also a popular poetry, and their work in theology and in general literature give at least evidence, how far the influence of those nations extended, from which they have borrowed their leading ideas and forms of art. The grammars and dictionaries of their languages by furnishing historic facts, not recorded in the chronicles, are indispensable for ethnography; lastly, each of them has an importance of its own, and fills a corner in the general picture of the East.

Some of those languages during the last year have given occasion to publications. The study of the Georgian language, which the Asiatic Society has first encouraged, has now taken root in Russia, its genuine soil, where it can flourish under the influence of the wants of government. Mr. Brosset, under the title of "Matériaux pour servir a l'Histoire de Géorgie,"[27] has edited a new redaction of the translation of the Georgian chronicle, the first edition of which was published some years ago at the expence of the Society.

Mr. Tchoubinof, employed in foreign affairs in St. Petersburg, and a Georgian by birth, has edited a Georgio-Russio-French Dictionary,[28] infinitely richer than vocabularies we previously possessed. The basis of it is that of Soulkhan Saba, which in Georgia was considered as the best, and together with the additions of Mr. Tchoubinof, contains about 35,000 words.

Mr. Dorn in Petersburg, has published an Afghan Grammar;[29] more exact than Klaproth's, and more detailed than that of Ewald. The literature of the Afghans being scanty, and to our present knowledge mostly consisting of imitations of Persian poetry, the scientific interest in the Afghan language is essentially ethnographic, for the problem of the origin of this people is not yet resolved, and the elements of its solution are to be found in the grammar and dictionary of their language.

The Malayan dialects, almost entirely neglected on the continent of Europe, have lately attracted some attention, and Mr. Dulaurier has

27. Taken from the Memoirs of the Academy of St. Petersburg, 1840, in 4to.
28. St. Petersburg, 184). in 4to.
29. Taken from the Memoirs of St. Petersburg, 1840, in 4to.

opened a course of lectures on the Malayan language in the school of the living languages. Not to mention that this language has its own literature, it is of great importance for ethnography, as the restless and trading race of the Malays is spread over an immense range of coasts and islands, and the history of this idiom for the greatest part is also that of the maritime population of the Eastern and Southern seas. A great scholar, the late Mr. W. De Humboldt, had seized on the solution of the problem which the origin of these people offers, and most thoroughly investigated it in his masterly work on the Kawi language;[30] the last two volumes of which have appeared last year under the auspices of the Academy of Berlin by the care of Mr. Buschmann. He founds his researches on the Kawi, the antient language of Java, reconstructing its grammar by analysing the text of Brata Yuddha. Then proceeding to a similar analysis of the other Malayan dialects from the Philippines to Madagascar, he supplies the insufficiency of his resources by the strictness of his method, and by the astounding penetration of his mind. The grammatical investigation is enriched in all parts of the work by memoirs concerning the influence of India on the Malays, on the antiquities of Java, on the influence of writing on language, etc. memoirs which render this work a mine of new and important ideas, and where the penetration and the mental power of the author are equally displayed.

Mr. Buschmann advertises, that he intends to publish the text and translation of Brata Yuddha, which will form the complement to Mr. De H.'s work. It is an epic poem, an imitation of the Mahabharat, of which Raffles had already given a part in Latin characters. Written in Kawi, it dates as the Indian Poem to a period when the influence of Indian ideas in Java had not yet submitted to the Musulmans.

After having presented to you this sketch, unavoidably incomplete, of the progress that Oriental literature has made since our last meeting, I would desire to add a few words concerning a subject which has occupied, and is now occupying a great many learned men, and which deserves the whole attention of a Society, destined for the interests of Oriental literature. I allude to the variety of systems, at present

30. Uber die Kawisprache auf der Insel Java, von W. Humboldt. Berlin, 1826, 39, 3. vols in 4to.

adopted, to express the Oriental by Roman characters. At the first intercourse of Europe with the East in the middle ages, oriental words were rendered in a most barbarous manner, and thence arose the origin of a certain number of monstrous names, some of which have been retained in all languages of Europe, as Mahomet, Mosk, Tamerlan, Gengiskan. Since the last half of the seventeenth century, the Latin translations of some Arabian works by Pococke, Golius, and others, and a little afterwards the popular works of Herbelot and Galland introduced a more exact orthography, by rendering the Arabian words as faithfully as the comparative deficiency of this alphabet permitted. A long time people were satisfied with this method of writing, but at last, and especially since the discovery of the Sanscrit had enlarged the circle of oriental studies, the want of a stricter method became apparent. A degree of exactness was aimed at to render again in the original characters, what had been previously expressed by the Roman alphabet; the systems, however, previously adopted, were unfit for this purpose, and whosoever attempted to reconstrue in Arabian characters verses, quoted by Herbelot, must have been convinced of this.

Since that period, systems rapidly succeeded each other. Founded on the most different principles which were calculated to avoid difficulties of several kinds, they have produced the most opposite results. Sir W. Jones so early as the year 1788, complained of almost every author having a system of orthography of his own. What would he have said of the number of systems, and the still greater number of orthographies without any system in the present day. Historians, geographers, travellers who never study the languages of nations, take at random the different orthographies and confound them, so that it is impossible to trace them to their sources, and hence ensues a mass of confusion. Of this I shall give some examples by taking the easiest familiar names I at present recollect. For instance, the name of Ali in works of our time is found thus: "Ali, Aly, Ali, Alee, Ulee, Ullee, Alli, Aliyy, Ahli, Alee." I find nine ways of expressing the word Koran: "Kuran, Ckooran, Alcoran, Alcorawn, Qoran, Coran, Koran, Ckoran;" six to write the name of Aboulfeda: "Aboulfada, Aboulfeda, Abulfeda, Abowlfida, Abowlfeda, and Aboulfidâi," and seven for the name of the legislator of the Arabs: "Mahomet, Mehemet, Muhammed, Mohammed, Muhammad, Mohhammad, and Muhummud."

In names so well known as those just quoted, there can hardly arise errors from these discrepancies in orthography; but in names of obscure men and places, the confusion arising from it, may be easily imagined. I shall give an example. Mr. J. Prinsep quotes an official and modern map of the Duab, where the road from Akbarpore to Cawnpore, a road very much frequented, is doubly entered, because the topographic bureau of Calcutta had found two routes with names, written in such different ways, that their identity not being recognised, they were believed to refer to parallel routes.[31]

It would perhaps have been better never to have deviated from the old system, however imperfect it was, as the thing of real importance is uniformity. But now it is too late to retrace our steps; the want of exactness having once been perceived, we must endeavour to supply it, hoping the introduction of a system, infinitely superior to the others, will re-establish that unity from which we are so far at present.

It is, meanwhile, I hope, not without use to classify the difficulties which such a system offers, and the attempts which have been made to remove them. These difficulties, it appears to me, are the following:—

1. Oriental alphabets have a much greater number of letters than ours.

2. Orientals do not always pronounce according to the rules of orthography.

3. They disagree in the pronunciation of the same letter in every country.

4. Europeans disagree in the pronunciation of the same letters.

1. Oriental alphabets have a much greater number of letters than ours. This especially has application to the Arabian and Indian alphabets. The means to obviate these difficulties, may be reduced to three classes.

a. The attempt has been made to enrich the Latin alphabet with some new characters. Thus has Meninski introduced the Arabian Ain; Volney modified the form of some Roman characters; Mr. Gilchrist invented a short u, and other learned men at a still later period used some Persian and Greek characters in their systems of rendering.

31. See the Map in "The application of the Roman Alphabet to all the Oriental Languages." Serampore, 1834, in 8vo.

None of these systems, however, were universally adopted, and the European public is not willing to tolerate the introduction of new characters into its alphabet.

B. It has been proposed to represent Arabic and Indian sounds by groups of European characters, as dh, th, kh, tt, ss, etc. This system has produced a great number of essays, but it has real inconveniencies; for if partially applied only, as the greater part of the learned do, the object which was in view with regard to it, is not attained; and if carried to the extreme, it renders strange the form of Oriental words, affording combinations of characters, which must appear barbarous to a European reader, as "Ckasr or Qasr, Hhadrat, Hadjdjadj," etc. Moreover, the system of expressing by double characters the simple ones which we do not possess, has the great drawback of leaving the reader in the dark concerning the orthography of the original, because he cannot know, whether the double character represent two characters, or be only the conventional representative of a single one.

C. Lastly, others have tried to modify the Latin alphabet by marks, not very apparent, which without producing new characters, exhibit various forms, by which the letters of Oriental alphabets may be easily exposed. This system, I think, was first proposed by Sir W. Jones, and adopted by the Asiatic Society of Calcutta, which, however, did not always adhere to it. According to it, the vowels are multiplied by accents, when they are short or long, and the consonants by points above or below. This system has had many imitators, and almost all Indian scholars have made similar ones for their rendering. Gilchrist has partly preserved it; the Geographical Society of London has adopted it with a few modifications; Mr. Erchhoff in France has made use of it in his parallel of the European languages; and lately, has Mr. Brockhaus proposed a similar one in Germany; Mr. Weijers has published another, resting on the same basis, and Mr. Arni, of Turin, has formed characters, on which he marks the different t, d, s, etc. of the Arabs by the same points, by which they are distinguished in the Arabic language. This method has the inconvenience easily to occasion errors, and to require a much larger printing apparatus, but it atones for these material difficulties by evident advantages. The European is not inconvenienced in his reading, for if he do not know the signification of the points added to the characters, he may easily overlook them, and

without their introducing an error, the reading of the words is not crammed with a mass of supplementary d'h and other characters; lastly, it approaches much nearer to that which only attempts to render the simple sound, without pretending to imitate all its shades, so that it is easy to identify words, written by a scholar, with those which a traveller, according to the mere pronunciation, has written down. The great mischief at present is the variety of systems, founded on this method; for we cannot expect, that the public shall become accustomed to this modification of the alphabet, unless the signs be generally adopted.

2. The Orientals do not always pronounce according to the rules of orthography, and this difference between the manner of writing and of pronouncing especially arises from euphonic laws. They, for instance, write al-Raschid, while pronouncing ar-Raschid. Mr. Weijers proposes to distinguish a character, subject to such a change, by putting it in italics; but this expedient displeases the eye, without indicating to the reader the real pronunciation. This problem is evidently indissoluble, and we have the choice between the sound and the orthography. The custom of the European nations with regard to this has established the excellent principle of submitting ourselves to orthography; thus is written in all European languages "Shakespeare, Bordeaux" etc., though the sound to be derived from this combination of letters, be much different from the real pronunciation. To follow the orthography is the only means not to efface the etymology of a word, and to preserve a chance of unity in renderings; yet there always remains a great confusion in the representation of short vowels, so differently pronounced in different words of the same language, that it becomes difficult to express them in all instances by the same vowel of our alphabet.

3. One and the same letter is differently pronounced by every Oriental nation. The Turks, for example, generally substitute for the short A of the Arabs and Persians a short E; the Musulmans of India in many instances pronounce an E long, when the Persians pronounce a long I; in Persia a long A is substituted for a long Ou.* The Ara-

* My readers will remember to give the sound of these vowels as in French.

bian ج is differently pronounced in different countries. The era of Mahomet, for example, is pronounced Hidjret in Syria, Higret in Egypt, Hijret in Arabia, etc. The confusion, arising from these variations, is often very great; for instance, the name of the present king of Lahore, is pronounced Schîr Singh in India; the first part of this name is, however, of Persian origin, and is pronounced in Persia Schîr. How then to render? The most logical method, even in a similar case, would perhaps be to adopt the pronunciation of the country where the word originated; but there fortunately are not many so complicated cases, and ordinarily, the renderings of a word may be without inconvenience in conformity with the orthography of the country from which it is borrowed.

4. The last difficulty is, that the European nations likewise differ in the pronouncing of one and the same Roman character, and at the first glance, this appears an insurmountable obstacle to a uniform system. Sir W. Jones was well aware of the confusion connected with this question, especially for the English, whose orthographical system is so complicated, irregular, and so deviating from the usages of all the rest of Europe. He had the wisdom to propose the adoption of the Italian pronunciation, and persuaded the Asiatic Society of Calcutta to consent to it, which since that time has continued to follow this system, the only one, by which the English Oriental scholars can be in conformity with those of the continent. Subsequently Mr. Gilchrist unfortunately did all in his power to undo the work of Sir W. Jones, by substituting the complicated English diphthongs for the simple vowels of the Italians. Almost all his pupils have adopted his system, and the Oriental geography and history have too much resented this unfortunate alteration. The oo, ee, u, have taken the place of the u, i, a, in most of the modern books of the Anglo-Indians, and the authority of all the learned Societies of England and India has in vain up to this time opposed this nuisance, though it appears to have lost ground, and we must hope that the principles of Sir W. Jones will again take the lead. There remain some other difficulties; the letters g, j, e and ch, (v, w, s, z,) have in every European language a different pronunciation, so that a congruous alphabet could not be adopted with uniformity in all European languages. These difficulties, however, not being very numerous, would not occasion much confusion, if every nation, as much as its idiotims

allow, try to approach to the others, and not prefer the extremes of its peculiar pronunciation, as the school of Mr. Gilchrist has done.

All these mutual concessions being granted, and all precautions taken, I do not think, that a uniform alphabet will be obtained, by which Oriental characters should be introduced into the text. It is generally known, what importance Volney attached to this idea, and the Committee of Public Instruction in Calcutta for some years thought to have so clearly solved this problem, as to encourage the publication of a great number of works in what is named, the Roman alphabet in India, and that this Committee for some time has suggested the truly monstrous plan of substituting, even for the natives themselves, this alphabet for their original ones. This experiment has not succeeded, and could not succeed; a system of expressing intelligibly an occasional passage of a language, and which may be useful for quotations, or when the original characters are wanting, may be applied to some languages, as for instance, has been done to the Sanscrit; but there are other languages which do not admit this expedient, as for instance, the Arabic language, where the orthography not only expresses the sounds, but often also the grammatical and etymological peculiarities which do not touch the ear, and would be lost by any rendering; thus I doubt, if any combination of Roman characters could represent the orthography of the word Koran. But there is fortunately no necessity for supplanting oriental characters; from this might arise some economical advantage in printing Oriental texts, but it would be infinitely less than the inconveniencies of every kind produced by it. We are rather in want of a system of expression sufficiently exact to reproduce the names of men and localities in a way which may approach to the ordinary application of the Roman alphabet, so that it is not repulsive to the mass of readers and authors, and only requires slight modification in its application to the languages of Europe. The adoption of a system, corresponding to these conditions, would be a benefit to literature, and no public body holds a better position than a Society such as yours to encourage and to direct discussion on all the points connected with it, and to arrive at a result which could obtain the assent, if not of all, which cannot be expected in such a matter, but at least of the majority of authors.

Proceedings of the Asiatic Society.

(Friday Evening, 6th May, 1842.)

The Hon'ble H. T. Prinsep, Esq. President, in the Chair.

G. Cheap, Esq. C. S. was proposed a Member of the Society by the President, seconded by the Secretary.

Books received for the Meeting on the 6th May, 1842.

Journal of the Royal Asiatic Society of Great Britain and Ireland. London, 1841, vol. vi. No. 12, 1 vol.

Proceedings of the Committee of Commerce and Agriculture of the Royal Asiatic Society of Great Britain and Ireland. London, 1841, (5 copies,) pamph.

The Calcutta Literary Gleaner, May, 1842, vol. 1st, No. 3rd, pamph.

The Calcutta Christian Observer, May, 1842, new series, vol. 3rd, No. 29, pamph.

Report on the Settlement of the district of Seharanpore, compiled by E. Thornton, 1840, 1 vol.

Actes de L'Académie Royale des Sciences, Belles Lettres, et Arts de Bordeaux. 1er. á 4e. Trimestres. Bordeaux, 1839, 4 vols.

Read a note from Dr. R. M. Thompson, presenting a Human Skeleton for the Museum of the Asiatic Society.

Ordered,—That the thanks of the Society be accorded to Dr. Thompson, and he be requested at the same time to state from whence the Skeleton is.

On the 22d April last, enquiry was made through Mr. Secretary Bushby, as to the number of copies of Dr. Cantor's Report on Chusan, (under publication as an article in the Asiatic Researches,) would be required by Government.

Read letter of 27th idem from Mr. Deputy Secretary Bayley, intimating that the Government would require 50 copies with the Drawings in illustration. The Secretary at the same time submitted to the inspection of the Meeting the drawings referred to.

Read letter of 4th May 1842, from Reverend J. Thomas, submitting Bill for printing the Index to the several volumes of the Mahabharut, and for binding the same, amounting to Co's. Rs. 2,012 : 7 : 9. Ordered to be paid.

Read the following two letters of the 13th February, and 10th March 1842, from Captain W. Macleod.

Moulmein, 13th Feb. 1842.

My dear Torrens,

The accompanying Image is one of two just sent me from Rangoon, (where it was dug up,) by order of the King's uncle, the Mekhara Prince.

The Prince is an honorary member of the Society, (vide his letter on his election 5th February, 1836, page 433,) and has a philosophic turn. He assisted greatly in the compilation of Mr. Lane's Dictionary of English and Burmese. If circumstances

permitted, (for though he is the King's uncle, and a member of this present Government,) he would willingly add to our information about his own country, but unfortunately, he is obliged to be very cautious in his intercourse with us. Indeed the manner in which the Images were sent shews this. Mr. Sarkies, to whom the Prince intrusted the dispatch to me of the Images, first proposed forwarding them through Mr. Browne, but after the departure from Rangoon of the King and Court, and finding a person, an Armenian countryman of his own, to whom he could trust, he sent them to me with a note from himself, and a memorandum from the Prince.

Mr. Sarkies writes,

"While the Prince of Mekhara was here, he gave me two ancient Idols, which he "ordered me to send to you, and which I now accordingly beg to forward by Mr. "Catchatoor. The object of so doing is to inform you, that this kind of Idol has been "also found in various parts of the world at different times. He hopes they will serve "you as a curiosity."

The Prince's Memorandum is to the effect, that "the Images are the same as those "found by Captain Hannay at Tagoung Myo, the inscription the same also in old "Deva Nagari characters, and that they must be at least 1800 years old."

I have just received them, and will make enquiries as to the localities where they were found, as Mr. Browne mentions a number of the same description were taken up. Rangoon is the site of an old city, and we may be able to trace some connexion between its foundation and that of the old city of Tagoung.

You will find an account of the Tagoung Images in the vol. of the *Journal of the Asiatic Society*, for 1836, page 157. I never saw the images therein referred to, but conclude they are with the Society.

Should you think fit to notice the subject in the Journal, perhaps the less prominently the Prince is brought forward the better. We are certainly much indebted to him for sending them.

Yours ever sincerely,

W. Macleod.

P. S. I got a vol. of the English and Burmese Dictionary for him from Bayley, but if you have any at the disposal of the Society to spare, I am certain he would esteem it a favour if you would present him with one. The copy he has, in that case I fancy he would place at the disposal of the King.

My dear Torrens,

Since writing to you with the Image, I found a Plate of the one brought down by Captain Hannay, in the *Journal ;* it differs from the one I sent you. The principal image in Captain H.'s is supported by two figures, whereas the Rangoon one has two Pagodas. The Mekhara Prince in his note mentioned, that those he sent me resembled some Dr. Bayfield brought down from Tagoung, but never having heard of these, I erroneously supposed His Highness had confounded Dr. Bayfield with Captain Hannay; but Dr. Richardson has put me to right. Both Dr. B. and Captain H. visited Tagoung, and both appear to have found images with the Deva Nagari inscription, though Captain Hannay's discovery only has been recorded.

I have not been able to hear any thing further on the subject.

Yours very sincerely,

W. Macleod.

Moulmein, 10th March, 1842.

The Image referred to, has been received, and placed in the Museum.

Read letter of 23rd March 1842, to Secretary to the Military Board from Captain G. B. Tremenheere, forwarding some concluding Remarks by him on his report on the Tin Grounds of Mergui.

Read letter from Mr. Secretary Bushby of 9th March last, forwarding Correspondence containing information on the Nurma Cotton Ground in Guzerat.

Read letter from Lieut. Colouel A. Spiers, Resident at Gwalior, of 25th March last, and enclosures on the subject of the Nurma Cotton Ground in Gwalior.

Read the following papers by Captain R. Shortreede, First Assistant, Grand Trigonometrical Survey ; viz.

On the calculation of Barometric Heights with Tables.

Remarks on some of the disturbing causes in Barometric Observations.

Remarks on an Inscription of a Magic Square, copied from an old temple in the hill fort of Gwalior.

The Secretary intimated that the subjects of the foregoing papers would be noticed by him in early numbers of the Journal.

Read letter of 9th April 1842, from Lieut. Baird Smith of Engineers, forwarding a " Note on the recent Earthquakes on the North-western Frontier." Lieut. Smith writes, " My object being to attract attention to these interesting occurrences, " and to secure some more methodical and carefully detailed information relative to " their various phenomena than we have hitherto had." The " Note" referred to, the Secretary intimated would be published in an early number of the Journal.

Read following Letter of 16th April 1842, from Dr. A. Campbell, of Darjeeling.

Darjeeling, April 16, 1842.

My dear Torrens,

I had not time to make a memorandum for the Society of the last hours of De Körös, but in my report to Government, forwarded this day, you will find almost all I could have said. You can readily get it from Bushby's office, and make any use of it you think necessary. It concerns you to look after the bequeathment of Rs. 5,000. I hope the Society will not think me an unworthy member for not having furnished you with a report, but to have attempted one formally, and for a learned Society, would have led to the notion that I believed myself capable, from a knowledge of the pursuits of the deceased, to do justice to his merits. Whereas in my official report to Government, this is not looked for, and still it may serve to communicate some interesting particulars to the world and his friends. I hope the Society will erect a monument over him. Here we would subscribe to it. What a pity it is that he did not die near Hodgson!

Yours, &c.

A. Campbell.

The Official Report referred to hy Dr. Campbell, has been forwarded by Mr. Secretary Bushby, for the information of the Society, and will appear in an early number of the Journal.

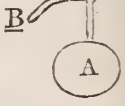
The report having heen read, it was proposed by the President, and seconded by Colonel H. Burney—That the Society record its deep regret at the death of this most ahle and eminent philologist and enterprising traveller, the loss of whose services in the exploration of countries so little known as Thibet, and its circumjacent regions, and in the elucidation of historical and philological questions, connected with the races which inhabit those interesting and almost unknown tracts, may he looked upon as a calamity to be deplored hy the learned world of Europe, and that the sum of Co's. Rupees One Thousand he placed at the disposal of Dr. A. Campbell, for the erection of a Monument, adding thereto a Tomhstone, with suitahle inscription to the memory of the deceased.

Read a letter of 12th April 1842, from Mr. G. T. Lushington, intimating that he had on that day "forwarded another specimen for the Society's Mu-"seum, which I hope and helieve will prove acceptable. It is the Skin of a Fox "brought down hy the Jowalier Bhotias this year, from the vicinity of the great "Himalayan Chain. The fur is, in my opinion, and indeed in that of all who "have seen it, very heautiful, and as it seems to have heen well preserved, I "hope your Curator will he ahle to make a good joh of it."

"I do not know whether you have any other specimen in the Museum, but think "it not likely that you have one, unless Hodgson may have sent one from Katman-"dhoo. The under-hair of the animal is something like that of the Shawl Goat in "fineness of texture. Its *habitat* may be said to be the lofty mountains of Jowa-"lier and other Bhote Mehals, in the vicinity of the eternal snows."

"I have another article ready for you, hut want to know whether it is worth "sending. If you already have it, of course it is not worth the carriage, but if it is "new to you, I think it will he prized.

"It is the Steam Blow-pipe used hy the Sonars of Almora, and other parts of the "hills. It is of copper, about five inches in height, and of this shape.



"The globe A being first slightly heated, the nozzle B is inserted "into a cupful of cold water, which it rapidly sucks up, thns "filling itself. It is then placed in a brazier, and the steam "formed by the hoiling water contained in the glohe is expelled at the nozzle

" B with considerable force, and thus produces a continued and powerful " blast.

" The people here say it came from " Cheen"—and believe one of the Nepalese " Soobahs first introduced it, about forty or fifty years ago. The curious part of it, I " fancy, is the distinct application of Steam to one art so many years ago, among a " people so utterly devoid of mechanical knowledge in other matters as our hill " men are."

The specimen has been received, and placed in the Museum, being previously mounted.

Read letter of 18th April 1842, from Lieutenant J. Brockman, H. M. 50th Regiment, presenting two Tartar Bows, &c. Quiver of Arrows taken at Amoy, also a kind of Sword taken at Chinhae.

The Secretary submitted to the Meeting private Seals and Seals of Office found in the house of the principal Mandarins of Amoy at the taking of that place; a Silken Belt, a Chinese Soldier's Uniform with the name and number of his corps on breast and back, taken at Ningpo from the Chinese Arsenal, and a curious Under-Shirt for wearing next the skin in hot weather, taken at the storming of Chinghae.

The whole presented by Mr. Dalrymple of the C. S. to whom the best thanks of the Society were voted.

The Secretary at the same time presented a Standard Colour of a Chinese Marine Regiment, and a Sword taken at the storming of the Bogue forts in China.

The following list of specimens were presented by Colonel H. Burney :—

An Echinite, from Jebel Jaise, near Cairo.

Specimen of a portion of the stem of a Fossil Palm, and samples of fossil exogenous wood, from the petrified forest near Cairo.

Ditto of Limestone, of which the great Pyramid is built.

Ditto of close Stalagmitic Limestone, whereof the splendid mosque now building by Mehemet Ali is constructed.

Ditto of the coarser of two kinds of Granite met with in the vicinity of the Pyramids, and of which some of the latter are partly constructed, together with various Sarcophagi.

Read petition of 2nd May 1842, from Sree Ram Govinda Sormona, praying to be presented with the last vol. of the Mahabharut for correcting the proof sheets of Sanscrit Books. The presentation ordered.

Read letter of 28th April 1842, from Lieutenant A. Cunningham, intimating that he was "busy with a very long article on the Coins of Kashmere. Fourteen plates are now finished, and the fifteenth is now being lithographed. A supernumerary plate must he added to contain the coins of various new, besides some curious types of known, kings, and the last plate will be one of Monograms, so arranged as to shew at a glance the names of all the kings who used any one Monogram, and all the Monograms which any one king used."

Read letter of 14th April 1842, from Dr. T. A. Wise, assenting to the proposal of printing his Commentaries on the ancient Hindoo System of Medicine.

Read Mr. Lovell Reeves' letter to Mr. Blyth, requesting proposal for the purchase of his book, (Systematic Conchology,) by the Asiatic Society. Ordered, that two copies (with colored plates,) of the work be subscribed for the Library of the Society.

The Curator read his Report for the month of April 1842, as follows:—

Sir,—I have the pleasure on this occasion to congratulate the Society on the variety of presentations made for their Museum during the past month, and on the number of different persons who have thus contributed to its enrichment. These donations have principally consisted of Mammalia, Birds, and Shells, with a valuable box of Insects from Afghanistan, and are as follow:—

Mammalia.

From Dr. Pearson, the Society has received a number of skins, but unfortunately not prepared for being mounted, which are referrible to the following species:

Ursus Tibetanus, the Black Bear of the Himalaya, figured by Mons. F. Cuvier.

Cervus (Styloceros) Muntjac, v. *Ratwa* of Hodgson: the *Kakur*, or Barking Deer of sportsmen.

C. (Rusa) Hippelaphus: the Sambur, adult and young.

Næmorhædus Thar, Hodgson: two skins of males.

Bos (Bison) grunniens: the Yak, a particularly fine skin.

B. (Taurus) Gaurus, v. *Bibos cavifrons*, Hodgson, and *Bos aculeatus*, Wagler: the Gaour; a very large skin, from Arracan. The Gaour, I may remark, ranges southward into the Malay Peninsula, from which locality there is a horn of this species in the Museum of the Hon. Company in London: the dimensions of one killed on the Keddah Coast, with a figure of the head, are given in the Royal Asiatic Society's Journal, III. 50; and there is a skull of a female, understood to be from the South of China, in the London United Service Museum. Dr. Helfer states that, in Tenasserim, "the great *Bos Gaurus* is rather rare, but *Bison Guodus** very common; besides another small kind of Cow, called by the Burmese *F'hain*, of which I saw foot-prints, but never the living animal." *J. A. S.*, VII. 860. Of this latter more presently. In

* Evidently a misprint for *Gavæus*, the Gayal; for the words may be written to look very much alike.

the Indian Peninsula, the Gaour inhabits all the extensive forest tracts from the Himalaya to Cape Comorin, and there can be little or no doubt that the *Guavera* of Ceylon, noticed by Knox, refers to the same species. Major Forbes, in his recently published 'Journal of Eleven Years' Residence' in that Island (II. 159), informs us that it has been extirpated in Ceylon for more than half a century. A correspondent of the 'Bengal Sporting Magazine,' (for 1835, 217,) writing from the southern Mahratta country, remarks, that "the Bison of this jungle differs materially from those of the Mahabuleshwer hills. The latter is merely a blue Cow of the colour of a Buffalo, but of large size. The regular Bison of Dandelly is a tremendous animal, its highest point being the shoulder." From this it might be inferred, that the North-western animal had not the same elevated spinal ridge; but I am little inclined to suspect that they are different, the more especially as I find the following passage in the 'Transactions of the Agricultural and Horticultural Society of India,' VII. 112. "The only wild cattle we have," observes the writer, J. Little, Esq. "is the *Gowha* of the natives *(Bos Gaurus)*. This animal is found in the dense jungles, along the whole range of the Western Ghauts from Assurghur to Cape Comorin. A male was shot at the convalescent station of Mahablesher, near the source of the Kristna, which measured at the shoulder fully seventeen hands high." I have credible information of a Gaour which stood not less than nineteen hands in vertical height. That the Gaour varies much in size, I can assert from personal observation of about forty skulls of this species*: one of an adult male taken to England, by the late Honorary Curator of this Society, Dr. Evans, is quite a pigmy in comparison with the enormous head in the United Service Museum. A head of a female, with the skin on, in that of the Hon. East India Company, was presented by the late Major-General Hardwicke, as the *As'l* or *Asseel Gayal* of that naturalist, (who figures it in one of the volumes of the 'Zoological Journal,') and of Dr. McCrae ('Asiatic Researches,' VIII. 495). The latter author speaks of it as the *Seloi* of the Cucis, or Kookies, and *P'hanj* of the Mugs and Burmahs; which last name is doubtless identical with the *F'hain* of Dr. Helfer, applied to another species.

In the passage I have already quoted from Dr. Helfer's list of Tenasserim animals, three species of this group are mentioned, the second of which I conclude to be the Gayal *(B. frontalis*, Lambert, Lin. Trans. VII. 57 and 302, v. *B. Gavæus*, Colebrooke, 'Asiatic Researches,' VIII. 487, v. *B. Sylhetanus*, Duvaucel, F. Cuv. *Mammal)*, which Baron Cuvier strangely suggests to be a breed between the common Ox and Buffalo ('Régne Animal,' I. 280, and again in his 'Ossemens Fossiles'), but which is a genuine species, of which splendid living examples were, not long ago, in the park at Barrackpore, perfectly tame and gentle. This animal has never been found to the westward of the Boorampooter, and its skull has lately been figured by Mr. Hodgson (Journ. As. Soc. 1841, 470). I am unaware that any trace of it exists in any Museum.

Another very fine species of this group is the Banteng of Java and Borneo *(Bos Sondaicus*, Muller, *B. Bentinger*, Temminck, and *B. leucoprymnus*, Quoy and Gay-

* In London alone, there are specimens in the British Museum, that of the Hon. East India Company, of the Zoological Society, Royal Asiatic Society, Royal College of Surgeons, London University, King's College, the United Service Museum, besides many in private collections, as that of Professor Bell, Mr. Blofeld of Middle Row, Holborn, &c.

mard), though, as regards the last, I have the authority of Dr. Schlegel of Amsterdam for asserting, that the individual described by these naturalists was a hybrid between the Banteng and the domestic species, such as are very commonly produced in Java, and especially in the Island of Bali, being trained there for domestic purposes. Sir Stamford Raffles notices, in his 'History of Java' (I. III), that "the degenerate domestic cows [of that island,] are sometimes driven into the forest to couple with the wild Banteng, for the sake of improving the breed"; and in Moor's 'Notices of the Indian Archipelago,' p. 95, we are informed that, in Bali, "the breed of cattle is extremely fine, almost every one of these beasts being fat, plump, and good looking; you seldom, if ever, see a poor cow in Bali: it is a breed of a much larger size than the common run of cattle in Java, and is obtained from a cross from the Wild Cow, with the same animal; they are generally of a red colour, and all of them are white between the hind legs, and about the rump, so that I do not recollect seeing one that was not white-breeched. The people have no land expressly devoted to grazing, but let their cattle eat the old stubble, or fresh grass of the rice-fields, after the crops have been taken off; and while the grass is growing, they let the cattle stray into the commons, and woods, and pick up what they can get by the road-side. The rude plough is drawn by two oxen abreast, which the ploughman drives with one hand, while he guides the plough with the other." There is a figure of a hybrid half-Banteng Javanese Cow in the collection of drawings bequeathed by the late Major-General Hardwicke to the British Museum, and of which I possess a rough copy.

The colour of the pure Banteng is similar to that of the Gaour and Gayal, or earthy-brown passing into black, with the four limbs white from the mid-joint downward, in addition to which this species has constantly a large oval white patch on each buttock, whence the name *leucoprymnus* bestowed by M. M. Quoy and Gaymard. Sir Stamford Raffles mentions, that "a remarkable change takes place in the appearance of this animal after castration, the colour in a few months becoming invariably red" (*Hist. Java*, I. III). Its frontal ridge has little tendency to become elevated; and the following is a description of the finer of two frontlets of the male in the Museum of this Society, presented by Prince William Henry of the Netherlands (vide J. A. S. VI. 987). Horns very rugous at base, flattened as in the Gaour and Gayal, but in a less degree, and somewhat similar in flexure to those of the Gaour, though approaching more in this respect to those of the Cape Buffalo, of a black colour, and twenty inches and a half long over the curve, fourteen and a half round at base, their widest portion thirty-five inches apart measuring outside, and tips returning to twenty-seven inches; at base they are six inches asunder across the vertex, widening anteriorly. According to Dr. Solomon Muller, "the Banteng is found in Java in territories which are seldom visited by man, as well in the forests of the plains and of the coast, as in those of the mountains, where it is pretty common. We have likewise seen traces of it in Borneo, and have even received a calf from the Dujaks about a month old. According to Raffles it is also found in Bali; but in Sumatra it does not appear to exist." Sir Stamford Raffles states, that "it is found chiefly in the forests eastward of Pasúran, and in Bali, though it also occurs in other parts of Java."

To the same distinguished statesman, we are indebted for the following piece of information respecting the domestic cattle of Sumatra:—"There is a very fine breed of cattle peculiar to Sumatra, of which I saw abundance in Menangkabu when I

visited the capital of that country in 1818. They are short, compact, well-made animals, without a hump, and almost without exception of a light fawn-colour relieved with white. The eyes are large and fringed with long white lashes. The legs are delicate and well-shaped. Among all that I saw I did not observe any that were not in excellent condition, in which respect they formed a striking contrast to the cattle generally met with in India. They are universally used in agriculture, and are perfectly domesticated. This breed appears to be quite distinct from the Banteng of Java and the more eastern Islands."—*(Lin. Trans.* XIII. 267.*)*

It is, I suspect, no other than a domesticated race of the "Wild Ox" of Burmah; an evident species, of which abundant notices may be found in various works, but no satisfactory description. A skull of such an animal, but unfortunately deprived of the horns, and which is very distinct in form from that of either of the foregoing species, exists in the London United Service Museum, and is labelled "Bison, from the Keddah Coast." I possess some very carefully prepared drawings of this specimen. Captain Gason, of Her Majesty's 62nd Regiment, who has himself been at the death of a Burmese wild bull, has favored me with the following particulars concerning this species:—"These animals stand about fifteen hands and a half high, are very *game*-looking, with a heavy body, but fine limbs. Their colour is bright yellowish-buff with a black line from the vertex to the tail, the legs black in front, the tips of the ears, muzzle, and tail-tip also black, and the belly perfectly white. There is little or no difference of colour between the sexes. The horns are cylindrical, rather long, and curve round in front to point towards each other. They are excessively timid, and are generally seen feeding in the valleys, often about a large tank." Captain Gason observed them at a place called Nathongzoo, about 250 miles eastward of Moulmein.

This is doubtless the species which is also mentioned in one of Colonel Hamilton Smith's letters to me, as a "Wild Ox, inhabiting to the eastward of the Boorampooter, and very different from the Gaour and Gayal. It is simply described," writes Colonel Smith, "as a fine-limbed and deer-like animal of great size, and of a bright bay colour, exceedingly like a Devonshire Ox, very active, fleet, shy, and watchful; living in small herds in the wooded valleys, with watchers on the look out, who utter a shrill warning sound on the least alarm, when the whole dash through the jungle with irresistible impetuosity." He elsewhere mentions their having white horns; and in Pennant's 'Hindostan,' I remember a notice of a wild species with white horns occurring somewhere further to the Eastward; this same work containing also the earliest mention of the Banteng of Java.

In a late number of the 'Bengal Sporting Magazine,' (for 1841, p. 444,) we are informed, respecting the Burmese Wild Cow, or '*Sine Bar*,' that "herds of thirty and forty frequent the open forest jungles [of the Tenasserim Provinces.] They are noble-looking animals, with short curved horns, that admit of a beautiful polish. The cows are red and white, and the bulls of a bluish colour. They are very timid, and not dangerous to approach. Their flesh is excellent. They are the only cows indigenous to the provinces:" yet the preceding paragraph mentions—"The Bison" (Gaour) as attaining a great size in the East.

One more quotation *apropós* to the foregoing observations, and I shall have done. Mr. Crawfurd informs us, that "The Ox is found wild in the Siamese forests, and

exists very generally in the domestic state, particularly in the southern provinces. Those we saw about the capital were short-limbed, compactly made, and often without horns, being never of the white or grey color so prevalent among the cattle of Hindostan. They also want the hump over the shoulders which characterizes the latter. They are used only in agricultural labour, for their milk is too trifling in quantity to be useful, and the slaughter of them, publicly at least, is forbidden even to strangers. Hence, during our stay, our servants were obliged to go three or four miles out of town, and to slaughter the animals at night. The wild cattle, for the protection of religion does not extend to them, are shot by professed hunters on account of their hides, horns, bones, and flesh, which last, after being converted into jerked beef, forms an article of commerce with China."—*Mission to Siam and Cochin China, page* 431.*

From Dr. Wallich, the Society has received another specimen of *Paradoxurus typus*, recent.

From P. Homphrey, Esq., a recent young specimen of *Pteromys Oral*, Tickell, procured at Midnapore.

From T. H. Maddock, Esq., Secretary to Government, four heads of Rhinoceroses, from Tenasserim; two of them belonging to the common Indian species *(Rh. Indicus)*, and the others to the oriental double-horned Rhinoceros *(Rh. Sumatrensis)*. The fact of all three of the Asiatic species of this genus inhabiting the Tenasserim Provinces was first made known in Dr. Helfer's list of the animal productions of that region, published in *J. A. S.* VII. 860; and that "a double-horned Rhinoceros is said to have been seen by the natives in the neighbourhood of Ye," is stated in the 'Bengal Sporting Magazine' for August, 1841; where, however, it would accordingly appear to be much rarer than the single-horned, "of which latter several have been shot by Europeans. They frequent the large jungles to the Eastward, but are more often met with in the jungles South of Ye." According to Dr. Helfer, it would, on the contrary, appear, that the double-horned is the prevalent species in that range of territory. "The *Rh. Indicus*," he informs us, "is found in the northern parts of the provinces, in that high range of mountains bordering on Zimmay, called the Elephant's-tail Mountains; the *Rh. Sondaicus* occupies the southernmost parts; while the *Rh. Sumatrensis*, or double-horned species, is to be found throughout the

* It is difficult to comprehend what animal can he meant by the Gyall of Bishop Heber's *Journal*, briefly noticed, and very rudely figured, as having been seen by that prelate in the Governor's Park in Ceylon; and equally difficult to understand what the following passage alludes to, in Mrs. Graham's work. At the Governor's house in Ceylon, this lady "saw, feeding by himself, an animal no less beautiful than terrible,—the wild bull, whose milk-white hide is adorned with a black flowing mane." Let me mention here, also, that there is a wild race inhabiting Madagascar that merits investigation. In Mr. Ellis's History of that Island, we read, that—"horned cattle are numerous, both tame and wild: many of the latter resemble, in shape and size, the cattle of Europe," whereas the domestic are all humped like those of India. Pennant notices this wild Madagascar race hy the name of *Boury*. There is also some animal bearing the appellation of "Wild Cow," which is met with in herds on the route from Agra to Barielly; and there are many wild humped cattle, of the common Indian species, said to be merely the descendants of domestic individuals, found in herds in certain of the jungles of the province of Oude, which are extremely shy and difficult of approach, and are of some interest as solving the problem in the affirmative as to whether the Zebu could maintain itself wild in regions inhabited by the Tiger (vide *Journal of the Asiatic Society*, IX. 623, and *Transactions of the Agricultural and Horticultural Society India*, VII. 112.

extent of the territories from the 17° to 10° of latitude." Now, from what is known of the habits of these animals, it is probable that the *Rh. Sondaicus* will prove to be the principal mountain species, though by no means limited to the mountains. In Java, according to M. Reinwardt, this animal "is found everywhere in the most elevated regions, and ascends, with an astonishing swiftness, even to the highest tops of the mountains" *(vide* 'Edinburgh Philosophical Magazine,' XIII. 34); and Dr. Horsfield notices, that "it prefers high situations, but is not limited to a particular region or climate, its range extending from the level of the ocean to the summits of mountains of considerable elevation.*** Its retreats are discovered by deeply excavated passages, which it forms along the declivities of mountains and hills. I found these occasionally of great depth and extent." This species is also an inhabitant of Borneo, where it is styled *Bodok;* but, according to Sir Stamford Raffles, ('Linnæan Transactions,' XII. 269,) it does not appear that a single-horned species inhabits that part of Sumatra with the productions of which he was best acquainted; "and the single horns which are occasionally procured, appear to be merely the larger horns of the two-horned species separated from the small one;" this, however, may be doubted now that the *Rh. Sondaicus* has proved to be common to Java and Tenasserim, and it appears probable, that while the latter only inhabits Java, it will be found to exist together with *Rh. Sumatrensis* in Sumatra, as both of these are said to be found together with the Indian species in Tenasserim. Whether more than one exists in Borneo we have at present no data for forming an opinion, and the discovery of the formerly supposed exclusively insular species on the Burmese mainland, casts a doubt upon which is the Chinese species noticed by Du Halde to inhabit the province of Quangsi, in latitude 25 degrees.

From M. J. Athanass, Esq., the Society has received a head, with the skin on, of the great Jerrow Stag of the Himalaya *(Cervus Aristotelis)*, which I exhibit together with a very fine head of the Sambur of India generally *(C. hippelaphus)*. On comparison, it is seen that the former is of a lighter colour, with the hairs more conspicuously tipped with pale fulvous or yellowish-brown; but there is little marked difference between the specimens that would induce a suspicion that they appertained to different species, although the Jerrow is somewhat broader in the forehead, and its antlers are more divergent. Had these antlers belonged to a fully mature animal, however, they would have exhibited a size such as is never attained by those of the Sambur; a magnificent pair in the Museum of the Hon'ble Company in London are nearly four feet in length; whereas it is rare that those of the Sambur exceed two feet and a half. This I am enabled to assert with more confidence, since I have examined numerous bales of Stag-antlers imported from this country, in the hope of discovering among them some belonging to new or little known species; but I have invariably found these packages to consist solely of those of the Sambur and spotted Axis, generally in about equal proportion, and have never once thus met with a specimen of a Sambur antler that approached in magnitude to that of an adult Jerrow. Mr. Hodgson has distinguished these species in the Society's Journal, (I. 66,) together with another which I am enabled to state positively is the *C. niger* of Prof. de Blainville (*Bull. des Sc.* 1816), and which is styled by Mr. Hodgson *Rusa Nipalensis*. The latter naturalist has supplied representations of the antlers of all three species, which are published in the Journal of the Asiatic Society, I. 115. "The Nipalese," he remarks,

"distinguish them with reference to the different shades of their, in general, uniform dark colour, by the epithets *Phusro*, *Râto*, and *Kâlo*, or grey, red, and black, *Jarai* [Jerrow.] The Phusro is the largest, being not less than a Horse in size; and has his dark hide copiously sprinkled with *phusro* or hoary. The Râto is the next in point of size, and is of a redder hue. The Kâlo is the smallest, and of a shining clear black. * * * All but the Kâlo species have a subterminal, as well as a brow antler." M. Blainville described his *C. niger* from a drawing which he saw at the India House, together with certain other drawings upon which he has founded his *Capra cossus*, *C. imberbis*, &c., and although these drawings could not then be found when I applied to see them some two or three years ago, I have since met with duplicates of them among those of the late Dr. Buchanan Hamilton, in charge of Dr. Wallich, marked, too, as having been (i. e. the originals) delivered at the India House in 1806, and the names are in Dr. Buchanan Hamilton's own writing which have been adopted by M. Blainville, except that the Goats are better styled *Capra Ægagrus Cossea* and *Ægagrus imberbis*, being clearly and obviously mere varieties of the common domestic species. The colour of *C. niger* (Buchanan Hamilton and Blainville) is represented brownish black, and the antlers, in accordance with Mr. Hodgson's description, have no subterminal branch or tine; indeed they so nearly resemble the figure in the Society's Journal, X. 722, that it might be supposed that both were drawn from the same individual.

With respect to the *C. equinus* of Colonel H. Smith, (which is not the Malayan species so denominated by Baron Cuvier,) if it really differ from the Sambur, it is probably the *C. Leschenaultii* of Baron Cuvier ('Ossemens Fossiles', IV. 32.) I have examined and possess figures of the frontlet of the identical individual described and figured from life by Colonel Smith, which is now preserved in the Museum of the London Royal College of Surgeons. The antlers measure two feet four inches in length, and eight inches round above the burr, with a brow-process fourteen inches long; their widest portion apart is twenty-two inches and a half, the tips returning to twenty inches, and those of the upper tine to fourteen inches; they have a differently granulated surface from ordinary Sambur and Jerrow antlers, being angulated and prickly instead of smooth to the feel, however coarsely tuberculated may be the others; and the tail of the animal is represented in Colonel Smith's figure to be slender and not bushy, in lieu of presenting that appearance which in the others has been compared to the tail of a docked horse that has been neglected*; the caudal disk, likewise, would appear to be more conspicuously developed, though it is doubtful whether either of these characters is of constant or normal occurrence: still it is worthy of remark that Colonel Sykes, in his Catalogue of the Mammalia of the Dukhun, ('Proceedings of the Zoological Society,' 1831, 104,) considers the large Rusa Stag which "abounds about the ghâts of Dukhun and in Khandesh as no doubt the same as the Malayan Rusa figured in Griffith's work. It wants the size of the *C. Aristotelis* [*Hippelaphus*] of Bengal, and is not so dark in colour"; and it should be observed that *C. Leschenaultii* of Cuvier was received from the Coromandel Coast. But Mr. Walter Elliot, in his recent Catalogue of Mammalia in the Southern Mahratta Country, ('Madras Journal,' No. XXV, 220), asserts, that "there is only one species of

* This difference might depend, however, upon the animal being then, perhaps, shedding its coat.

Rusa found in the western forests, which is common also to all the heavy jungles of Southern India." None of the descriptions given by Hamilton Smith to the different Indian species under the names of *Hippelaphus*, *Aristotelis*, *Equinus*, apply exactly to it, but I have little doubt that all three are varieties of the great Indian Stag referred to *Hippelaphus* of Aristotle by M. Duvaucel, and to which it is not improbable that the *C. unicolor*, or *Gona* of Ceylon, is likewise referrible, &c." For my own part, I had an opportunity of examining several pairs of antlers of the peninsular animal while at Madras, and I considered them to be genuine Sambur, and I much incline to agree with Mr. Elliot in the opinion that there is probably but this one species of the group inhabiting Peninsular India, though it is quite certain that there are two others in the northern hills, as was first satisfactorily shewn by Mr. Hodgson.

From Lieutenant Tickell, a highly interesting collection has been received of specimens procured at Chyebassa; viz.

Cheiroptera: Twelve skins, referrible to five species; viz. a *Rhinolophus*, two specimens; *Vespertilio pictus*, four specimens*; another and much larger species, allied in its colour and markings to the preceding, but very different in the quality of its fur, three specimens; a small dark species, apparently the same as is very common about Calcutta, two specimens; and a beautiful *Scotophilus*, of a bright golden fulvous colour on the under-parts, one specimen. These I shall endeavour to determine as I find leisure to undertake the task, but the descriptions to which I have access are, for the most part, too meagre to permit of arriving at satisfactory conclusions from them.

Pteromys Oral, Tickell: five specimens; suggested by me on former occasions to be identical with *Pt. petaurista*, to which it is very nearly allied; but its size is inferior, and colour comparatively devoid of any rufous tinge. On comparing the skull, that of *Oral* is shorter and smaller, with the superior orbital margin and post-orbital process conspicuously less developed, the upper rodential tusks are directed more abruptly downwards, and the series of grinders are more than proportionally smaller. I have had the skulls prepared of both the adult and young *Pt. Oral.*

Cervus (*Stylocéros*) *Muntjac:* a nearly grown female.

C. (*Rusa*) *Hippelaphus:* skin of a fine male, prepared for stuffing; but unfortunately too much injured by insects to be available for the purpose. The head of this specimen has already been noticed, and compared with that of the Himalayan Jerrow.

Tetraceros chickera: labelled *Antilope chickera*, and I believe correctly referred to that species of Major General Hardwicke, *(Lin. Trans.* XIV. 520,) though being a young kid, the species is difficult to determine with absolute certainty. The skeleton of the original specimen described by Hardwicke, and beautifully figured from life by Hill, is deposited in the rich Museum of the London Royal College of Surgeons: as often happens with captive sheath-horned ruminants, the blunt-tipped superficial sheathing which temporarily invests the harder permanent sheath of the horns of the young animal, had been retained in this adult specimen, which Dr. Leach not understanding, he was led to consider as belonging to a different species, the frontlet of a wild-shot specimen in the same collection, which he has styled *T. striaticornis*. A true second four-horned species, however, has been described by Walter Elliot, Esq.,

* This occurs in the neighbourhood of Calcutta.—E. B.

('Madras Journal,' No. XXV. 225), as *Ant. subquadricornutus*, being characterized by larger size, and by having the anterior pair of horns scarcely developed, while the posterior pair is longer than in the preceding species. Both of these animals were known to me in England. The name *Chickera*, according to Mr. Elliot, is applied by all natives to the *Gazella Cora* of Colonel Hamilton Smith, which I have the authority of that learned naturalist for identifying with *Ant. Bennettii* of Sykes, rightly referred by Mr. Elliot to *A. Arabica* of Hemprich and Ehrenberg; though Colonel Smith's appellation takes precedence. The Museum of this Society contains a stuffed specimen of the kid of *G. Cora*, and numerous heads of adults; and I have seen many fine examples of the species, and among them a pair now living in Calcutta: nor is this the only species of true Gazelle inhabiting India. Mr. Gray has described, or at least named, a *Gazella Christii*, founded on a pair of horns obtained, if I remember rightly, in the Thurr, or great sandy desert north of Cutch, and deposited in the British Museum; and there is a stuffed specimen of the same species in the United Service Museum, received from Bombay, which satisfactorily establishes its existence. The *G. Christii* is a typical *Gazella*, inferior to *G. Dorcas* in size, and remarkable for its very pale colouring; the horns are smaller and much more slender than in *G. Cora*, less freely thrown out, and take the usual curve backward in this group, having the tips very abruptly bent inward. Proceeding westward, another species, the *G. subgutturosa*, inhabits Persia and the foot of the Caucasus; while *G. Dorcas* is found in Arabia in addition to *G. Cora*.

Respecting the present species, or *Tetraceros chickera*, a writer in the 'Bengal Sporting Magaziue' mentions, that "it is found in the forests at the bottom of the Sivalik hills, and is considered a rare species: as the places it inhabits can only be beaten by Elephants, and this animal generally breaks cover at the distance of eighty yards, bounding off in a succession of short leaps, it is not very easily shot. The back pair of horns are about four inches, and the fore one inch and a half in length. This species," it is added, "is called *Chouka* or *Chousinga*, while *Chickera* is applied to either *subulata* or *acuticornis*."

Captain Brown states, in the same periodical, that—"The *Shikara*, a small antelope yet undescribed, is found in Hurriana; both sexes have horns, of a slender form without rings, and about eight inches in length; the animal is about half the size of the common Antelope [*A. Cervicapra.*] There is another Antelope also found in Hurriana, with slightly compressed horns, having rings, bending backward, and ten inches in length: both these species being unknown to naturalists." The latter is perhaps *Gazella Christii*, and the former doubtless identical with "an elegant small-sized Antelope, with horns in the females, numerous about Delhi;" as noticed by another observer in the same work.

These diminutive Antelopes of India are greatly in need of elucidation. In the Royal College of Surgeons, London, there exists a frontlet from this country, to which Prof. Blainville has assigned the name of *Ant. subulata*, and a single horn of another species, which he has designated *A. acuticornis*. These are described in Colonel Hamilton Smith's valuable treatise on the *Ruminantia*, published in the 4th volume of Griffith's English edition of Cuvier's 'Animal Kingdom,' and I possess original drawings of both specimens, which I shall take an opportunity of publishing in the Society's Journal.

Bos Gaurus.—The specimen prepared for mounting, as noticed in my last monthly Report to the Society, has since arrived, in a condition sufficiently uninjured to render it probable that we shall be able to set it up,—an undertaking which is now in progress.* The only portions injured are the forehead, which unfortunately has been partly denuded of its hair, and the back of the neck, which latter will however not be very observable in the stuffed specimen. If we succeed to my anticipations in mounting this enormous animal, it will certainly form a highly attractive object in the Society's Museum, and it will be the first example of the species which has been thus set up in any collection, as our skeleton of the same beast is likewise the first, and I believe still the only one, that any institution can boast of. Our late Honorary Curator, Dr. Evans, took with him, however, two skeletons of female Gaours to England, but had not succeeded in disposing of them when I left that country.

Manis pentadactyla, Lin.: a specimen remarkable for the unusual degree to which its hard scales have been worn down, probably from the narrowness of the rocky crevice that may be supposed to have led to its customary retreat, as those of the croup are thus ground away to the greatest extent. Moreover, the animal had lost one of its hind limbs, in consequence of which part of the weight of its body fell on the corresponding side of the tail, so that the series of lateral caudal scales on that side are so much rubbed away, that a sectional view of them is exhibited, wherein the expanded inferior surface no longer exists, and the apical point of each scale is considerably above and extends laterally beyond the side-angle. The general colour of this specimen is browner, or less glaucous, than is usual in the species.

Our Museum contains two other strongly characterized species of (presumed) Oriental Pangolin, of which one is, I suspect, undescribed.

For a long while, two species only were generally recognised of this genus,—the Long-tailed and Short-tailed Pangolins, or *Manis tetradactyla* and *M. pentadactyla*, Auctorum, which Cuvier was the first to refer distinctly to the continents of Asia and Africa respectively. The judicious Pennant, however, in the last edition of his 'Quadrupeds,' referred to an animal killed in Tranquebar, as described and figured in the 60th Volume of the 'Philosophical Transactions,' as probably representing a distinct species, which I think there can be no reasonable doubt of. M. Desmoulins has also described one, in his 'Mammalogie,' as *M. Javanica:* and the Cape species has been distinguished by Mr. Smuts, in the 'South African Journal,' as *M. Temminckii*, since more fully described and compared with its then known congeners by the late accomplished Secretary to the Zoological Society, Mr. Bennett, in the 'Proceedings of the Zoological Society', 1834, 81. Mr. Hodgson, next, described the Nepalese species as distinct from the currently admitted Indian one, by the appellation *M. auritus*, in the Journal of this Society, V. 234; but it is clear that he misapprehended the meaning of the description of the Indian species in Griffith's Catalogue, where the expression "eleven longitudinal series" of scales is intended to signify the central and successive lateral ranges, counting obliquely down each side of the body. The identification of Mr. Hodgson's alleged species with the ordinary Short-tailed Pangolin, Auctorum, has already been announced by Mr. Ogilby, in the Zoological Memoir annexed to Dr. Royle's 'Illustrations of the Botany, &c. of the Himalaya

* And which has succeeded beyond expectation.—E. B.

Mountains'. Unquestionably, it is the species described as *Manis pentadactyla* in Shaw's 'Zoology,' I. 81, and it is as clearly the *Manis Indica*, v. *pentadactyla*, Lin. of M. Lesson, in the *Dict. Class. d'Hist. Nat.*, where the following synonyms are appended; *M. brachyura*, Erxl., *M. macroura*, Desm., and *M. crassicaudata*, Geoffroy: but the "Pangolin" of Buffon (*Hist. Nat.*, X. 187, pl. XXXIV), as distinguished from his "Phattagen," is obviously a distinct species from any now recognised; and the passage which that illustrious naturalist quotes from the traveller Desmarchais, and which has been copied by every subsequent writer on this genus, descriptive of a species called *Quogelo* by the Negroes of Guinea, which is said to attain to eight feet in length, of which the tail measures four, very clearly denotes another species of Pangolin as yet unknown to modern cultivators of Zoology. The differences of Buffon's "Pangolin" from the ordinary species of this country, is noticed in the first volume of the 'Asiatic Researches' (p. 376), where a figure is given of the Indian animal, and there is a notice of its anatomy in the second volume of the same work (p. 353), but containing no details elucidative of specific distinctions. Dr. Cantor informs me, that the geographic range of this species extends eastward to Chusan; and Pennant quotes Dahlman (in *Act. Stockh.* 1749, 265), noting its existence in China, where it is termed *Chin Chian Seick*, and also mentions its occurrence in Formosa. In Assam I have been informed that there are Pangolins of very large size, in all probability a distinct species: and from the same region a still more interesting species of edentate animal may be looked for by zoologists.

With these preparatory observations, I now proceed to notice a species which appears, so far as I can find, to be undescribed; but I regret to add that I have been unable to learn its native locality. It approaches very near to the "Phattagen" of Buffon, or Long-tailed Pangolin of Africa, but has the tail considerably less elongated than in that species, though more so than in any other known to systematic Zoology. I shall designate it *Manis leptura*. Length of the specimen thirty-nine inches, of which the tail measures eighteen, and the head four; on each foot are five claws, the innermost on the fore-feet minute: although considerably larger than two specimens before me, which I refer to *M. Javanica*, the claws on its fore-feet are smaller and more curved, while those on the hinder are longer: in (presumed) *Javanica*, the middle fore-claw, though worn at the tip, measures fully an inch and three-quarters, and the next externally one inch and three-eighths; whereas the corresponding measurements in the new species are one inch three-eighths, and one inch: but on the hind foot, the middle claw of *Javanica* scarcely exceeds three-quarters of of an inch, and the next externally is under five-eighths of an inch; while in the new species these measure, respectively, an inch and a quarter, and one inch: following out the comparison, the head of *leptura* is considerably more slender and elongated, measuring two inches and three-eighths from eye to snout, and having no trace of ear-conch; in *Javanica* there is a distinct ear-conch, and the distance from eye to snout is but an inch and five-eighths; the animal, however, being considerably smaller, though not in that proportion. In *Javanica*, the scales upon every part are comparatively uniform in size, and there is no abruptly marked difference of dimensions between those of the head and neck; in the new species, as in *pentadactyla*, those of the head are very much smaller: in the former, the lateral scales of the body are strongly carinated, while in the latter they are but very slightly so indeed: the scales on the fore-limbs are much smaller, more nume-

rous, and differently disposed, in the new species from what they are in *Javanica*, appearing as hexagons instead of lying in quincunx order; on the hind-limbs the same diversity exists, but is less strongly marked. Protruding from beneath every scale of *Javanica* are seven or eight conspicuous bristles; while in *leptura* one or two only can be discerned here and there, scarcely more than in *pentadactyla*. The number of series of scales consists in *leptura* of nineteen, and in *Javanica* of seventeen; the central row from the occiput to the tail-tip of the former consists of fifty-three, to which may be added ten upon the head. Lastly, the under-parts are less hispid in *leptura* than in *Javanica*, and the tail is both narrower and longer. The general colour of the scales in *leptura* is deep rufous-brown, while those of *Javanica* are blackish-brown, and of *pentadactyla* whitish or glaucous-brown. In the specimen now presented, however, of the latter, as before remarked, the colour of the scales is darker and less glaucous than usual.*

* Since the above was written, the extremely interesting account of the ordinary Indian Pangolin, by Lieutenant Tickell, has appeared in the *Journal (ante*, p. 221, *et seq.)*, and the analogies presented by this animal and the Great Anteater *(Myrmecophaga jubata)* of South America, of which so interesting a notice has been published by M. Schomburgk, (*P. Z. S.* 1839, 24,) are worthy of being studied.

The retension of the fœces was observed in both instances; and M. Schomburgh supplies us with a hint as to what food the Pangolin may not improbably be maintained upon in captivity. Of an adult *Myrmecophaga*, he writes: "It began to feed on the third day; we gave it ants and farina; the latter, a preparation of cassada root, it never refused. The ant's nests in the neighbourhood were soon exhausted, and more by way of experiment than out of persuasion that the animal would eat it, some small pieces of fresh beef were placed before it; to our greatest astonishment it ate the meat with avidity, and has since been chiefly fed on fresh beef and fish. We observed that in the course of three weeks it evacuated only twice, and then very copiously; this was likewise the case with the young one; and before I noticed the same circumstance with the adult, I thought its death was partly caused by constipation." So, likewise, in Lieutenant Tickell's Pangolin, after it had fasted several days, "there was a quantity of the remains of ants in its stomach, and the rectum was full of fœces."

The *Myrmecophaga* "secretes a liquid substance, transparent like water, which drops almost constantly out of its nostrils and mouth; this is the more remarkable, as it used very little water." It does not appear that the same was noticed of the Pangolin.

The prodigious strength of both animals is sufficiently attested by the osseous and muscular conformations subservient to its display.

Both raise themselves on the hind legs to reconnoitre; but the *Myrmecophaga* exhibits the more usual structure having reference to this habit, as it possesses plantigrade hind-soles; while the weightiness of the tail may be inferred to afford considerable aid to the Pangolin in enabling it to maintain those remarkable attitudes observed by Lieutenant Tickell. While the latter creature, however, would appear to be wholly incapable of active defence, the former rises on its haunches, and strikes with the sharp claws of one of its fore-feet at its enemy, while the other remains pendent, and only in cases of great danger throws itself on its back, and strikes with both fore-feet, or embraces with its fatal hug. The little two-toed Anteater has likewise been observed to defend itself by striking with one of its fore-limbs.

The very curious little animal last noticed has been ascertained to feed on the nymphæ of arboreal *Hymenoptera*, which it seizes with great address by means of its nipper-like fore-claws; and M. Schomburgh relates, of the Great Anteater, that—"It attempted frequently to take up objects with its paws; in which manœuvre its long claws assisted wonderfully. * * * It climbed up the palings of its pen with great agility, never using both of its arms at a time, but first one and then the other; and if it had taken hold sufficiently with its claws, it raised the whole body, and brought up the hind-feet. We may conclude from this fact upon the strength of the muscles of its fore-limbs. The great muscle of the arm, of one which we dissected, was two inches wide, and three-eighths of an inch thick.

Among the specimens procured in the neighbourhood, I shall only notice *Pachysoma marginatum*, which I find is of common occurrence in this vicinity.

Aves.

Lieutenant Tickell's Birds consist of 120 specimens, which are referrible to eighty-one species, twenty-seven of which are new to the Society's Museum, and have enabled me to identify many of those described by Major Franklin and Colonel Sykes, (in the 'Proceedings of the Zoological Society' for 1831 and 1832.) I distinguish such as are new to our Museum by an asterisk.

Palæornis Alexandrinus: female.

P. torquatus, ditto.

Falco luggur, Jerdon, ditto.

F. tinnunculus.

* *Aquila Vindhiana*,* Franklin, *P. Z. S.*, 1831, 114.

* *Spizætus* (Vieillot) *albogularis*, Tickell; genus *Nisäetus*, Hodgson, *J. A. S.*, V. 228. Length twenty-two inches, or rather more, of wing from bend sixteen inches, and tail ten inches; bill over curve (including cere) one inch and three-quarters to forehead, and one inch and five-eighths from point of upper mandible to gape; tarse three inches, and feathered to the toes. General colour of the upper parts black, with a shade of brown; the nuchal feathers white at base, and the occipital prolonged to form a crest two inches and a half in length: throat, fore-neck, and breast pure white, the sides of the last having a narrow black central streak to each feather: belly, flanks, under tail-coverts, fore-part of the under-surface of the wings, and plumage of the legs, deep rufous, darkest on the lengthened tibial feathers, and streaked longitudinally with black on the sides, the posterior feathers of which (under the wing) are wholly dusky-black; rest of the wing albescent underneath, the terminal portion of the primaries, beyond the emargination of their inner vanes, barred inferiorly with black, and chiefly on the inner vanes, the outer but very faintly so; and tail brownish above, the central feathers darkest, and albescent like the wings on its under-surface, which

"I have already remarked how fond the young one was of climbing, and this, coupled with what I have just now related, makes me not doubt that, if circumstances should require it, they climb trees in the wild state with the same agility."

The mode of walking upon the knuckles, with the claws bent upwards and inwards to the leg, is common to both genera, though confined to the fore-feet in *Myrmecophaga*, whereof the trenchant claws are however better protected, being received into a groove, while a callous pad projects to increase the surface upon which the animal treads. The fossil genera *Megatherium*, *Megalonyx*, and *Cœlodon*, would appear to have advanced on the ground in the same manner as their recent allies the *Myrmecophagæ*, being intermediate to these animals and the Sloths, and especially, it would seem, approximating the diminutive two-toed Anteater; and as this South American group is represented in the Old World by the Pangolins, which likewise have enormous fossil congeners, so the other great American group of Armadilloes, with their huge fossil allies (the *Hoplophorus*, Lund, vel. *Glyptodon*, Owen, &c.), is represented in Africa by *Orycteropus;* and who shall say, when the fossil treasures of that grand continent shall have been exhumed, what mighty creatures of the past bearing that affinity to the existing *Orycteropus*, which the giant Pangolins and huge *Edentata* buried in other continents do to their existing analogues of the same regions, may once more glory in the light, to uphold the classic fame of Africa as the "land of monsters?"

* I regret to add that this and several other specimens have since been utterly destroyed by the *Dermestes*, their skins not having been poisoned, while other and poisoned skins that were with them have totally escaped injury.—E. B.

has a series of narrow dusky bands indistinct on the outermost feathers, and successively more developed to the central; above, these bands are also seen, but obscurely: the ear-coverts are white towards the eye, and elsewhere rufous, each feather having a medial streak of black. "Irides dark; beak leaden-blue, its cere and base wax-yellow; toes yellow, and talons black," the latter large and powerful. The plumage of this fine specimen had been newly renovated, and a few of the old feathers remaining on the wings and among the upper tail-coverts are of a moderately dark brown colour, contrasting with the much darker or blackish hue of what is evidently the livery of maturity.

Circætus (Hæmatornis, Vigors,*) undulatus,* Vigors, *P. Z. S.,* 1831, 170, and figured in Gould's 'Century,' part I: male and female.

Circus melanoleucos: marked female, in dress precisely resembling that of the male. This species is not rare near Calcutta.

C. Swainsonii, A. Smith, *S. Afr. Journ.* 1831; *C. pallidus,* Sykes, *P. Z. S.,* 1832, 80: female.

Otus brachyotus.

Ninox lugubris; Strix lugubris, Tickell, *J. A. S.,* II. 572; *Ninox Nipalensis,* Hodgson, *Madras Jl.,* No. XIV. p. 23.

Athene Indicus; Noctua Indica, Franklin, *P. Z. S.,* 1831; 115; *Strix Brama,* Temminck.

**Ath. undulatus; Strix undulata,* Tickell, *J. A. S.,* II. 572. *Ath. erythropterus,* Gould, *P. Z. S.,* 1837, 136; *Noctua perlineata,* Hodgson: male and female.

Strix flammea.

**Buceros Malabaricus*: two fine specimens.

**B. gingianus*. two adults and a young specimen.

Coracias Indica: two specimens.

Merops viridis, v. *Indicus.*

* "*Bucco viridis,* Gmelin; *B. Zeilonicus,* Latham, Brown, *Ill. Zool.* pl. XV.; *Kettorea,* Vieillot; *B. Lathami,* Vieillot, *Encl. Method.*; *B. caniceps,* Franklin, *P. Z. S.,* 1831, 121." Jerdon, *Madras Jl.* XI. 217.

B. Indicus: two specimens.

Picus (Brachylophus) Bengalensis: male and female.

* *P. (Dendrocopus) Mahrattensis:* male.

———— *nanus,* Vigors, *P. Z. S.,* 1831, 172: male.

—— *(Meiglyptes) badius:* female.

Centropus pyrrhopterus: female.

* *C. lepidus,* Horsfield, *Lin. Trans.* XIII. 180†. Length fourteen inches, of wing six inches and one-eighth, and middle tail feathers seven inches and three-quarters, exceeding the outermost by three inches and seven-eighths; bill to forehead one inch, and to gape one inch and a quarter; tarse one inch and three-quarters; long hind claw an inch one-eighth. General colour dark chestnut-brown above, pale fulvescent underneath, passing into white on the throat and belly; wings principally bright chestnut-rufous, and tail black, more or less rayed across with rufous. The plumage

† I have recognized this species from Dr. McClelland's drawing of an Assamese specimen transmitted to the India House, and referred by Dr. Horsfield to this species; the description above referred to being insufficient for the purpose.

of the upper-parts, to the inter-scapularies and scapularies inclusive, and of the lower parts to the breast inclusive, is of the usual character in this genus, having rigid and pointed shafts, which are yellowish-white, contrasting on the upper parts with a dusky border; while the feathers on the hind-part of the back, rump, and on the belly, are short and downy: scapularies indistinctly barred with dusky, as also the feathers on the sides of the neck and breast, the bars on these being contracted into spots: sides, tibial plumes, and under tail-coverts, fulvescent-white, and more distinctly barred with black. The specimen described is a young male, which had nearly assumed the adult plumage, but has a few feathers of the juvenescent garb remaining; the adult primaries and secondaries are thus shown to be uniform chestnut-rufous, while the immature are barred with black; and the adult tertiaries only differ from the primaries in being tinged with dusky: tail black, with a slight green shine, and tipped with whitish, the uropygials and upper coverts barred with rufous: rump dusky, tipped with rufescent and whitish, and belly pure white. "Irides carmine. Bill light horn: and legs dark leaden-blue."

Macropteryx longipennis, Swainson; *Hirundo klecho*, Tem.: male.

Crypsirina vagabunda.

Pastor tristis.

P. cinereus, Jerdon: two specimens.

**Edolius cærulescens.*

Lanius Hardwickii.

Graucalus Papuensis; G. Nipalensis, Hodgson, 'Indian Review,' I. 327: male and female.

Pericrocotus (Phœnicurnis, Sw.*) princeps*: a male and two females.

Muscicapa melanops, Vigors, *P. Z. S.*, 1831, 171, and figured in Gould's *Century*, plate VI.

M. cærulea, Vieillot; *M. occipitalis*, Vigors, *P. Z. S.*, 1831, 97: female, being the *M. cæruleocephala*, Sykes, *P. Z. S.*, 1832, 85.

**M. picata*, Sykes, *P. Z. S.*, 1832, 85: two males. This species is erroneously identified by Mr. Jerdon with the *M. hirundinacea*, Reinwardt, v. *M. obscura*, Horsfield, *Lin. Trans.* XIII. 146, and figured by him in the 'Zoological Researches in Java'; but the latter is at once distinguished from it by having no white on the wings, nor on the sides of the neck; neither are any of its tail-feathers white-tipped. The African *M. picata* of Swainson was subsequently so named, and must consequently receive another appellation.

* *M. Poonensis*, Sykes, *P. Z. S.* 1832, 85.

* *Muscicapa* (?) *superciliaris*, Jerdon, *Madras Journal* No. XXVI. 16; *Dimorpha albogularis*, Nobis, *ante*, p. 190.

**Hirundo filifera*, Stephens; *H. filicaudata*, Franklin, *P. Z. S.*, 1831, 115; *Wire-tailed Swallow* of Latham.

Ixos jocosus: male and female.

——*pusillus; Hæmatornis* (Sw.) *pusillus*, Nobis, *Report* for last September, *J. A. S.*, X. 841: male and female.

Chloropsis aurifrons, Jardine and Selby; *Chl. cæsmarhynchos*, Tickell, *J. A. S.* II. 577: two specimens marked female, and not differing in plumage from the adult male, further than that there is less yellow surrounding the black of the fore-neck. This handsome species is no despicable songster, and lives and sings well in confinement.

Iora typhia; I. scapularis, Horsfield; *Motacilla subviridis*, Tickell, *J. A. S.* II. 577.

**Parus xanthogenys*, Vigors, *P. Z. S.*, 1831, 92, and figured in Gould's 'Century,' pl. XXIX, fig. 1.

**P. Nipalensis?* Hodgson, *Ind. Rev.* II. 31 (*P. cæsius*, Tickell): two males. This bird agrees minutely with Mr. Hodgson's full description, excepting in being a trifle smaller. Length about five inches, of wing two inches and a half, and tail two inches and a quarter; bill to forehead (through the feathers) seven-sixteenths of an inch, and to gape half an inch; tarse five-eighths of an inch.

**Dendrophila frontalis*, Swainson.

**Sitta castaneoventris*, Franklin, *P. Z. S.*, 1831, 121, and figured in Jardine and Selby's 'Illustrations of Ornithology,' pl. CXLV, the beak being represented much too short: male and female; the latter having the under-parts very much paler rufous than in the male. Although I entertain no doubt that this is the species indicated by Major Franklin, still our Museum contains a specimen of another species to which the Latin definition furnished by that gentleman equally applies. This latter is altogether a stouter bird, with the bill especially much broader, and not—as in the other—distinctly and conspicuously compressed for the basal two-thirds: length of wing three inches and one-eighth, and of tail an inch and three-quarters; whereas in the male and female *castaneoventris*, these measurements are respectively three inches and two inches seven-eighths, and an inch and a half. The *generic* markings and coloration are so similar, that really I do not see how the dry specimens can be further characterized apart; yet a glance suffices to shew their non-identity as species, and the one now indicated is considerably more allied to the British Nuthatch than is the other, which last displays a close affinity with *Dendrophila*, not observable in that with which I am comparing it. With respect to colour, the hues of *castaneoventris* are altogether softer and more delicate, and in both sexes the grey of the upper part of the head and neck is conspicuously paler than that of the back; whereas in the other, although the head and nape are seen, on particular inspection, to be somewhat lighter than the back, this would scarcely be noticed, unless attention were expressly directed to the observation. In *castaneoventris*, the upper tertiaries are uniformly bluish-grey, and in the rest there is no strongly marked distinction between the dusky of the inner web, and the grey external margin; but in the other species, the external blue-grey contrasts abruptly with the black of the internal portion of the feather, which last, too, extends over a considerable part of the outer web, as is not the case in *castaneoventris*: this distinction may perhaps vary somewhat in amount of development in different specimens, but I suspect will always be found to prevail more or less decidedly. In the male *S. castaneoventris*, the colour of the whole under-parts, from the white throat to the mottled under tail-coverts, is of a deep dark ferruginous; while in the female it is not very much darker than in a British Nuthatch, having the fore-neck and breast a sort of dull isabelline hue tinged with ferruginous, and the belly and flanks darker and more deeply tinged with the latter. In the new species (sex unknown), the fore-neck, breast, and lower parts are uniformly coloured, and much paler than in the male *castaneoventris*, but deeper than in the female, being of a dull rusty cinnamon tint, with the throat and beneath the eye white, as in the others. I shall venture to designate this bird *S. cinnamoventris*.

A species is figured and described by Messrs. Jardine and Selby, *Ill. Orn.*, pl. CXLIV, as *S. Himalayensis*, which, if not the same, must be very closely allied to that described by Mr. Hodgson (in *Journ. As. Soc.* V. 779,) as *S. Nipalensis* ;* the latter naturalist also describes an *S. corallina (loc. cit.)*, which would appear to border closely upon *Dendrophila frontalis*, and there is another *Dendrophila* adverted to by Mr. Swainson as *D. flavipes*, with which I am unacquainted. These are all the Indian species of the present group I as yet know of, and as many as three are now ascertained to inhabit Europe, besides several in North America.

Oriolus Hodsonii, v. Asiatic *melanocephalus:* a male in mature plumage, and one in second plumage, or that which succeeds to the nestling garb; this second dress representing the *O. McCoshii*, Tickell, *J. A. S.*, II. 577, and being generally mistaken for the female livery of the species.

Turdus unicolor, Gould, *P. Z. S.*, 1837, 136, but not *T. unicolor*, Tickell, *J. A. S.* II. 577; which latter having been first bestowed, it is necessary to rename the present species, which I therefore propose to designate *T. modestus.*

**T. (Oreocincla*, Gould,) *parvirostris*, Gould, *P. Z. S.*, 1837, 136: two males.

Petrocincla Manillensis (?) ; Turdus Manillensis, Gmelin; *le Merle Solitaire de Manille*, Buffon, *Hist. Nat., Ois.*, II. 363; *P. Pandoo*, Sykes, and the female *P. Maal*, Sykes, *P. Z. S.*, 1832, 87-8. Accordingly, this species would extend to the Phillipines, Tenasserim, and Peninsular India; but I am not yet certain that the Indian bird has ever any rufous on the under-parts. A specimen from Luçonia, which I adjudge to be a young male once moulted, has the whole upper-parts, throat, and breast, cyaneous, tipped with dusky-brown on the crown, with greyish—across, which passes a blackish bar—on the interscapularies, and with whitish—having a similar black bar—on the scapularies and small wing-coverts; throat, fore-part of the neck, and breast, also broadly tipped with fulvous-white, having a black subterminal cross-streak; belly, under tail-coverts, axillaries, and fore-part of the under-surface of the wings, deep ferruginous, the abdominal feathers broadly edged with whitish, having a narrow black subterminal band, and above this more or less cyaneous, especially on the flanks; wings and tail dusky-black, more or less edged with cyaneous and whitish: in this state of plumage it is the *Turdus Manillensis*, Gmelin. A specimen from Tenasserim, minutely agreeing in all other respects, has the feathers of the upper-parts less bordered, the axillaries and under-surface of the wing have merely a few slight traces of the rufous colouring, which is replaced by cyaneous, the large under tail-coverts are partly of this latter hue, which is also considerably developed on the abdominal feathers, and almost wholly supercedes the rufous on the flanks. Another specimen from Tenasserim has but a very slight trace of rufous left towards the vent and bordering the under tail-coverts, being elsewhere wholly cyaneous, excepting the dusky black of the large wing and tail feathers, and the tips of some of the wing-coverts, which are whitish. Finally, the Chyehassa specimen is totally devoid of any rufous trace whatever, but has most of its clothing feathers slightly dusky-tipped, with minute pallid extreme tips, in which condition of plumage it accords with *P. Pandoo*, Sykes. A female, being the *P. Maal*, Sykes, before me, (locality unknown,) corresponds in plumage to the same sex of the Himalayan *P. erythrogastra*, but has

* The Society has since received *S. Nipalensis* from Mr. Hodgson, and it is distinct.

the upper-parts of a dingy bluish grey-brown, the large wing and tail-feathers principally dusky, coverts more or less whitish-edged, and under-parts mottled with whitish, having a dusky black subterminal cross-band to each feather. In *P. erythrogastra*, the deep rufous tint of the under-parts of the male is permanent and constant, but in a very few, I have seen an additional slight rufous patch surrounded by the cyaneous of the fore-neck.

**Motacilla variegata*, Latham, *Gen. Hist.* VI. 320; *M. picata*, Franklin, *P. Z. S.* 1831, 119: a male in summer and another in winter plumage.

Anthus arboreus.

Cinnyris Mahrattensis: adult and young.

C. Sola: male.

Zosterops Maderaspatanus: two males.

**Pyrgita flavicollis:* female.

**Amadina punctata:* young male.

**Estrelda formosa; Fringilla formosa*, Latham, *Ind. Orn.* I. 441, 23, as quoted in Shaw's 'Zoology,' IX. 466: male.

Erythrospiza—? (*rosea*, apud Hodgson). A species very different from the *E. rodopepla* and *E. rodochroa*, figured by Gould, and which is commonly sold alive by the dealers in Calcutta. I have now several living specimens of it. Lieut. Tickell names it *Pyrrhula roseata*, but I doubt much if a prior name might not be found, although I have myself been unsuccessful in satisfactorily determining the species. Length five inches and three-quarters, of wing three inches and a quarter, and tail slightly forked, its outermost feathers two inches and a quarter; bill to forehead above three-eighths of an inch, and considerably bulged; tarse five-eighths: general colour, in winter aspect of plumage, deep ruddy on the upper parts, passing into dusky-roseate on the forehead, rump, and upper tail-coverts; the nuchal feathers tinged with ashy, and the dorsal margined with dusky-olive; throat and breast roseate, paling below the belly, and lower tail-coverts rosy-white; wings and tail dusky, the feathers edged with ruddy-brown, a little albescent on the outer edge of the tips of the tertiaries; bill and feet horny. In summer aspect of plumage the feathers have lost their marginal edgings, the back appears greyish-brown, and the crown, throat, fore-neck, and rump, are brilliant crimson. The female is altogether olive-brown, paling below, and whitish on the belly; the wing-coverts and tertiaries are tipped with pale yellowish-brown, and the clothing feathers of the upper parts, excepting on the rump, with those of the fore-neck, breast, and flanks, are centred darker. Song a feeble twittering, but soft and pleasing, intermediate to that of the European Goldfinch and that of the small Redpole Linnet; the call-note much resembles that of a Canary-bird, which group indeed this species nearly approximates in its conformation.

Columba Javanica: an injured male.

C. (Alsocomus) puniceus, Tickell: six specimens. A splendid species of Dove, allied to the last, and also nearly related, it would seem, to the Javanese *C. lacernulata* of Temminck; but differing from that species, as described, by having dusky-black upper tail-coverts, in the bill not being "wholly black," but vinaceous-purple at base with a greenish-yellow tip, and presenting some other minor discrepancies. Length fifteen inches and upwards, of wing eight inches and three-quarters, and tail six

inches and a half; bill to frontal plumage three-quarters of an inch, and tarse seven-eighths of an inch. "Irides orange with a red outer circle; feet dull lake." General colour rich and deep vinaceous-brown, having the whole top of the head, including the occiput, whitish-grey; primaries and secondaries, with the coverts of the primaries, winglet, and tail and its coverts, black, most of the large wing feathers inclining to grey towards their margins; rump also black, the feathers margined with glossy dark amethystine-purple; interscapularies broadly edged with the same, changeable to green, which latter predominates, while a reddish gloss prevails on the edges of the scapularies and wing-coverts; throat paler in some specimens, and the under-parts generally less glossy than those above.

Gallus Bankivus: male and female. The latter remarkable for bearing powerful spurs, which is very unusual in this sex.

Francolinus vulgaris: two males and two females. The *Perdix Hepburnii* of Gray, with its alleged variety, appear to me to be meant for females, or perhaps young males, of this common species.

—— *Pondicerianus:* male and female.

*—— *Northiæ; Polyptectron Northiæ*, Gray and Hardwicke: female. Length eleven inches and a half, of wing five inches and a half, and tail three inches and five-eighths; bill to forehead three-quarters of an inch, and to gape seven-eighths of an inch; tarse one inch and a half. "Irides dull orange, bill horn-coloured, legs and feet vermillion." Space between the bill and eye almost nude, and deep coral-red in the dry specimen. All the upper parts rufous-brown, with two or three black bands on each feather, beyond the last of which the tip of the feather is less rufous; there is also a number of minute black specks on each plume, in addition to the bands; rump and upper tail-coverts minutely freckled; the tail-feathers chiefly blackish, with mottled rufous bars tending to become obsolete; primaries, their coverts, and the winglet, spotless dusky; crown blackish and subcrested; the neck olive-brown, albescent on the throat; on the lower part of the fore-neck the feathers become rufous in the centre and tipped with black, being laterally margined with olive-brown; and on the breast and flanks they are bright ferruginous with narrow black tips, somewhat like those of an English cock Pheasant; belly fuscous-brown, and under tail-coverts resembling the upper; wings and tail dusky underneath. The *Perdix oculea* of Hardwicke and Gray would seem to be nearly allied to this species.

Coturnix dactylisonans: three specimens.

C. textilis, Tem.: a female.

**Hemipodius Dussumieri.*

Cursorius Asiaticus.

Pluvianus Goensis: two specimens.

P. bilobus.

Limosa melanura.

Totanus ochropus.

Anastomus typus, Tem.: young.

Ardea Javanica: adult and young.

**Porzana Akool: Rallus Akool*, Sykes, *P. Z. S.*, 1832, 164.

**Mergus serrator:* female.

Sterna seena, Sykes.

**Carbo albiventer*, Tickell: female. Length about twenty-nine inches, of wing eleven inches, and tail (consisting of fourteen feathers,) seven inches; bill to forehead (in a straight line) two inches and a half, and to gape three inches and seven-eighths; tarse two inches and a half; longest toe and claw three inches and three-quarters. Colour of the whole under-parts white, but apparently changing to dusky on the fore-neck and breast; flanks dusky brown; upper-parts dingy dark-brown, but a number of new feathers appearing on the scapularies and shoulders of the wings, dark silvery grey with a moderately broad black margin, analogous to what is observed in various other species; feathers of the crown and sides of the neck slightly margined laterally with whitish; bill dusky above, the rest pale; gular skin yellow, and feet and membranes black.

From M. M. Liautaud (Chirurgien de Marine) and Reymoneng (Eléve) of His French Majesty's Corvette, the *Danaide*, I have to announce the presentation of a collection of bird skins and of shells from various regions; the former consisting of, firstly, the following European species, killed in France:—

**Alceda ispida.*

**Turdus torquatus*: female.

Oriolus Galbula, ditto.

Sturnus vulgaris.

**Charadrus pluvialis.*

From Panama (Republic of New Granada),

**Tanagra episcopus.*

From Chili (neighbourhood of Valparaiso),

**Turdus Magellanicus*, Vigors, *P. Z. S.* 1830, 14; being a new locality, I believe, for this species, which is allied to the well known Robin Thrush of North America.

From Bone Bay, in the Caroline Islands,

**Ptilinopus purpuratus*, Swainson: the example of which most elegant species, heretofore known as an inhabitant of O Tahiti, has unfortunately been denuded by insects of the skin of the fore-part of the forehead and throat.

From Luçonia, of the Philippines,

Petrocincla Manillensis: being the specimen before noticed in my account of the collection of bird-skins presented by Lieutenant Tickell.

**Ceblepyris cœrulescens*, Nobis. Length nine inches and a half, of wing four inches five-eighths, and tail three inches and a half; bill to forehead (through the feathers) fifteen-sixteenths of an inch, and to gape an inch one-eighth; tarse three-quarters of an inch: fourth, fifth, and third primaries successively longest; outermost tail-feathers not half an inch shorter than the middle ones. Colour of the upper parts black, the feathers edged with bluish dusky, paler on the forehead, and inclining to greyish on the rump; tail and greater wing-feathers wholly black; lower parts uniform dark greyish-dusky; the tips of the outermost tail-feathers paler underneath; bill and feet black, as are also the lores.

From Captain C. S. Bonnevie, of the Norwegian Royal Navy,—

Specimens of *Laphastur**, Nobis, n. g? Allied to *Pernis*, but wanting the peculiar

* This may possibly be the genus *Buteopernis* adverted to by Mr. Jameson, in *Calc. Journ. Nat. Hist.*, No. III. page. 320.

character of that genus, the loral feathers resembling those of most other *Falconidæ*: beak also distinctly, though feebly, toothed; and the cere much less developed than in *Pernis*: talons very feeble, and the anterior tarsal scales but semi-reticulate. Rest as in *Pernis*, and the medial occipital feathers elongated, as in *P. cristatus*, Cuv., v. *Falco ptilorhynchus*, Tem.,—as also in the genera *Hyptiopus*, Hodgson, v. *Lophotes*, Lesson (pre-occupied in Icthyology), v. *Lepidogenys*, Gray, and *Spizætus*, Vieillot, v. *Nisætus*, Hodgson.

**P. Jerdoni*, Nobis: adult and young. Length about eighteen inches or nearly so, of wing twelve inches and a half, and tail nine inches; hill, over forehead, including cere, an inch and a half, and from point of upper mandible to gape an inch five-eighths; greatest vertical depth about five-eighths of an inch, and arcuation (as in *Pernis*) very moderate; tarse anteriorly one inch and three-quarters, having the upper half feathered; middle toe and claw two inches, the latter barely exceeding three-eighths of an inch, and hind claw little more than half an inch. Lengthened occipital feathers of a spatulate form, and two inches and a quarter long in both specimens. Plumage of the adult, on the upper-parts, of a hair-brown colour, each feather broadly terminated with dusky-brown, having a fine reddish-purple gloss, which terminal portion is alone externally visible on the back and scapularies; primaries, secondaries, and tertiaries, crossed with a few bars of the same, and the latter edged at the tip with whitish; tail light hair-brown, with a broad subterminal dusky band, and three successively smaller ones, likewise successively less distant to the base; its extreme tip whitish: beneath, the wings and tail are whitish-grey, with only the terminal bands as much developed as above. Lengthened occipital plumes dull black; and the nape and sides of the neck rufous-brown, with a medial dusky streak to each feather, more or less developed. Lower-parts whitish, somewhat broadly banded across below the breast with rufous-brown; the sides of the breast rufous; and a mesial line on the throat, fore-neck, and breast, composed of feathers which on the throat are almost wholly blackish, becoming less deep and mingled with rufous on the fore-neck and breast, where laterally margined with white. Beak horn-coloured, with a pale cere; and legs have probably been yellow. The young merely differs in having each feather of the upper-parts slightly margined with whitish, and those of the lower-parts are analogous to the immature plumage of the genus *Accipiter*; the mesial dark streak flanked with whitish may be traced almost to the vent, and this is merely the same, further developed, as exists upon the throat of a common Indian species of *Accipiter*, viz. *A. Dussumieri*, v. *Dukhunensis* of Sykes. I dedicate this handsome species to a naturalist to whose persevering researches students of Ornithology in this country are deeply indebted, and whose investigations, I am happy to say, now extend throughout the series of the animal kingdom, and may be expected to add considerably to our information on the Zoology of India.

Picus leucogaster, apud Horsfield, Catalogue of Javanese Birds prefixed to 'Zoological Researches in Java': *P. Javensis*, Horsfield, *Lin. Trans.* XIII. 175; but not *P. leucogaster*, Reinwardt, apud Bory, *Dict. Class. d'Hist. Nat.* XIII. 507, if the size be there correctly stated; the breast, too, is described as "noire, rayée de roussâtre," but this may be the case in some specimens, as a few of the pectoral feathers of a female in the Society's Museum have slight rufous-white edgings, and the colouring of the female bird is otherwise correctly enough described by M. Bory.

Dr. Horsfield strangely describes the *P. pulverentulus*, Tem., as the female of this species, but we now possess both sexes, and the female only differs from the male in having no crimson moustache, nor on the crown but only on the occiput. This fine species is closely allied to the *P. Hodgsonii*, Jerdon, *Madras Journ.* vol. XI. 215, and there admirably figured, but is not quite so large, having the wing but eight inches and a half, and tail but six inches and a half, and it differs in having scarcely any trace of white above the tail, but only a narrow incomplete cross-band just above the coverts; there is also a very slight lateral margining of this colour to the feathers of the throat, and to the posterior ear-coverts; and the wings inside anteriorly, with the axillaries, are also white; the white of the belly being somewhat deeply tinged with fulvous. The present and our previous specimen are both from Bengal. A much injured skin from Tenasserim has considerably more white about the croup, thus further resembling the magnificent *P. Hodgsonii*: and I make no doubt that the so called *Picus maximus Malayensis*, described by Dr. W. Bland in *J. A. S.* II. 952, refers to no other; the colouring exactly corresponds, if *fulvescent* be read for "yellow" on the belly and under wing-coverts; but the dimensions there assigned considerably exceed those of our specimens.

Gracula religiosa.

* *Vanga cristata*, Vieillot, badly figured in Griffith's Animal Kingdom, VI. 486.

Euplocomus erythropthalmos: female.

Captain Bonnevie being desirous of putting this Society in communication with the *Collegium Academicum* of Christiana, for the purpose of exchanging duplicates of Indian specimens for such as could be procured for us in the North-west of Europe, I have gladly assented to his request by sparing for that body certain duplicate Zoological specimens, for the most part procured in this immediate neighbourhood, and not required for the Museum of the Hon. Company in London; and I have also furnished him, at his kind request, for transmission to the Norwegian institution, with a list of such desiderata procurable in Northern Europe, as would enrich and add much to the interest of our own Museum.

From J. J. Athanass, Esq.,

Phœnicopterus ruber: a beautiful adult specimen of this Flamingo, forwarded alive from the Upper Provinces, and which reached us before life was quite extinct, and consequently in a favorable condition for being properly mounted, its plumage being uninjured, with the exception of the wings.

Also skins of

Gypaëtos barbatus, Storr; considered by Captain Hutton to be a distinct species—*G. Himalachanus*, *J. A. S.* III. 22, but which I agree with Mr. Hodgson (*Ibid.* IV. 458,) in inclining to regard as that found in Europe and North Africa, the more especially as among the drawings of the late Sir Alexander Burnes, I find one of a specimen devoid of the dark pectoral cross-band, which Captain Hutton presumes to be characteristic of the Lammergeycr of the Himalaya: a splendid adult.

Circœtus undulatus.

From Dr. Pearson,

"*Accentor Himalayanus*" ? *; vide *J. A. S.*, *ante*, 187.

* Distinct from two species of *Accentor* recently forwarded to the Society from Nepal by Mr. Hodgson.

From David Ross, Esq.,

An egg of the Cassowary *(Casuarius galeatus)*.

From J. P. Hampton, Esq.,

Plotus Vaillaintii v. *melanogaster:* the Oriental Anhinga. A magnificent adult male, in finest possible condition of plumage. The anatomy of this bird I only very cursorily examined, from pressure of other occupation, and rather regret that I did not put the body aside in spirits; though I doubt not I shall soon obtain others, as I understand the Anhinga is not rare within a few miles of Calcutta. However, the general conformation of the soft parts was essentially that of the Cormorants, as might be anticipated; the capacious stomach possessed the accessory sac (analogous to that of the Crocodile) found in other *Totipalmati*, Cuv.; the intestines were long and furnished with the two small cœca usual in this group; and the sternal apparatus, which has been preserved, is absolutely similar to that of a Cormorant.

From J. L. H. Gray, Esq. I have the pleasure to record the donation of skins of a very fine pair of

Argus giganteus, Tem.: male and female; and one of

**Phäeton* ——— ? or Tropic bird; species undetermined.

From Mr. J. Keirnander,

**Aptenodytes Patachonicus:* Patagonian Penguin; the brightly coloured portion of the fore-neck and breast.

From —— Borradaile, Esq.,

Strix flammea: the common Barn Owl of Europe, which is of very frequent occurrence in Bengal: a living specimen, since dead and added to the Museum.

From E. B. Ryan, Esq., two living Hawks; viz.

Elanus melanopterus; and

Circus rufus: both mounted in the Museum.

From Lieut. Phayre, through Dr. McClelland,

Ardea purpurea: the common Purple Heron; a specimen from Arracan.

Among the Birds procured in the neighbourhood, or from the dealers, I may briefly notice—

Palæornis Alexandrinus, v. *nipalensis*, Hodgson, *As. Res.* XIX, 177: young male, purchased.

P. Malaccensis: ditto.

**Lorius ornatus*, Stephens: ditto.

**Falco tinnunculoides*, Tem.: adult female.

Circus rufus v. *æruginosus.*

C. Swainsonii, v. *pallidus.*

C. melanoleucos.

Cuculus fugax, Horsfield, v. *C. Lathami*, Gray: a good series.

C. canorus: the true British Cuckoo, which I have now living in a cage.

Phœnicura atrata.

**Budytes citreola* ?

**Coturnix textilis.*

Grus cinerea.

Parra Indica: adult and young, which latter totally wants the conspicuous white eye-streak of the adult, and is otherwise so different, that until I obtained a specimen in a state of change, I rather inclined to doubt their specifical identity.

Dendrocygna major, Jerdon.

Tadorna Bellonii v. *vulpanser*, Auct: the European Shieldrake, of which this is the second specimen I have met with in the bazaar; and lastly, I shall only further mention

Glareola torquata ; the Collared Pratincole: a specimen of which I had the good fortune to procure alive, leading me at a glance to perceive its true affinities, which heretofore had constantly puzzled me, in common, I believe, with every student of Zoology who has bestowed attention on the classification of Birds. Linnæus arranged this bird as *Hirundo pratincola ;* and Baron Cuvier included its genus among his *Echassiers* or "Stilt birds;" viz. the *Grallatores*, or "Waders" of modern English systematists, remarking—"Nous terminerons ce tableau des échassiers par trois genres qu'il est difficile d'associer à d'autres, et que l'on peut considerer comme formant séparément de petites familles." The three genera adverted to are *Chionis*, *Glareola*, and *Phœnicopterus ;* which are associated also by M. Temminck in his heterogeneous assemblage of odds and ends, styled by him *Alectorides*. Now, of these three genera, the first, or that of the Sheathbill *(Chionis)*, has been satisfactorily referred by M. Blainville, on anatomical data, to the immediate proximity of *Hæmatopus*, an association of which the propriety is readily seen when once suggested*, and on similar data I have long been satisfied that the Flamingoes *(Phœnicopterus)* should be ranged among the *Lamellirostres* or *Anatidæ*, a position which has also been assigned to them by Mr. Swainson: this latter author, in common with most of the recent British writers on Ornithology, has referred the Pratincoles to the *Charadriadæ*, or Plover family, associating them more immediately with *Cursorius ;* but Mr. Jenyns (in his *British Vertebrata)*, really as if selecting the most *outré* position he could find, has included this genus in his *Rallidæ*†! There, too, Mr. Yarrell (in his 'British Birds') has followed him in grouping it; but this naturalist was so fortunate as to obtain an egg of our present species, which he has figured, and remarks that "the Pratincole has been arranged by some authors with the Swallows, by others near the Rails: but I believe, with Mr. Selby, that it ought to be included in the family of the Plovers; and had I known its Plover-like habits and eggs sooner, I should have arranged it between *Cursorius* and *Charadrius*." The figure of the egg which he has given, however, appears to me to accord still better with my view of the affinities of this genus. Several years ago, Mr. Gould called my attention to the fact that the Collared Pratincole had a slightly pectinated middle claw, and suggested to me whether, after all, the great Swedish naturalist was not right, at least in bringing this bird among the *Insessores Fissirostres* of Vigors; but at that time I inclined to hold a different opinion, and so far as the structure in question is concerned, that alone could scarcely influence the systematic position of the genus, as it occurs in widely separated families‡; and as I have further always held the opinion

* Allied to *Chionis* are the remarkable genera *Attagis*, d'Orbigny, and *Tinochorus*, Vieillot, from the South American Cordilleras, and the anatomy of these equally refers them to the same systematic station. Vide Zoology of the Voyage of the Beagle under Captain Fitzroy.

† I need not ask what character it has in common with the Rails, but rather what it has not in direct and obvious opposition to them?

‡ *E. g.*, in many *Caprimulgidæ*, *Ardeadæ*, and *Pelicanidæ;* its intent being apparently to cleanse the *rictus* from such fish-scales, &c. as may adhere thereto, or, in the instance of the *Caprimulgidæ*, to detach the legs of beetles which may ditch, and thus impede the bird's swallowing them.

that the *Pressirostres* and *Longirostres* of Cuvier (corresponding to the *Charadriadæ* and *Scolopacidæ* of modern English systematists) composed but a single great series, essentially distinct from the *Cultrirostres*, Cuv. (*vel Gruidæ et Ardeadæ*), which the illustrious French zoologist interposed between the former, an analogous conformation was not wanting in that series, as instanced by the Black-tailed Godwit (*Limosa melanura*), while no trace of it occurs in the Bar-tailed Godwit (*L. fedoa*). Examining, however, the entire foot of a recent Pratincole, it will be seen that the resemblance it bears to that of *Caprimulgus* extends to the peculiar scutation, to the general form of the toes, and especially to the circumstance of the back-toe being directed inward; and whoever has witnessed the creeping gait of a British Moth-hunter (*Caprimulgus*) on the ground, will not fail to recognise in that of the Pratincole an exact similarity: moreover, many species of *Caprimulgus* have the tarse as much elongated as in *Glareola*, and I have been informed that certain of these assemble numerously on the mud flats near the shores of some of the West India Islands, where their habits would appear to resemble those stated of the Pratincoles. The mode of flight, too, of the latter is absolutely that of the Moth-hunters, and not by continuous flappings, as in all the *Charadriadæ*. But what first led me to perceive the affinity which this genus bears to *Caprimulgus*, was the expression of the physiognomy of the living bird, as I held it in my hand, and, to descend to particulars, the semi-tubulate form of its *nares*, and downward curvature of the short bill seen alike in both, though the latter is so much larger and stouter in *Glareola*; then, looking to the feet, the similitude was at least equally striking, while the form of the wings and tail, and mode of flight, were such as might be expected to occur in a diurnal modification of the family *Caprimulgidæ*, and together with the wide gape helped to remove this genus from the grallatorial order altogether. Even the egg, as figured by Mr. Yarrell, has not the pointed form at one end, characteristic of those of the Snipe and Plover series; but would appear to resemble nearly that of a *Caprimulgus*, in shape as well as in markings. On the other hand, the discrepancies of *Glareola* with any of the varied forms of nocturnal *Caprimulgidæ** are sufficiently obvious externally, while internally there are some very strongly marked differences; such as the configuration of the sternum, which is doubly emarginated posteriorly, and otherwise more approximates the form of this important portion of the skeletou of the *Charadriadæ*, while the tongue also is broad and flat, with a thin serrated tip, and the muscular coat of the stomach is considerably developed,—particulars at variance with the type of *Caprimulgidæ*, but which I only now briefly advert to, since I have not lately procured an example of the latter family with which to institute an anatomical comparison. Upon the whole, I have arrived at the opinion that the Pratincoles are more nearly related by affinity to *Caprimulgidæ* than to any other family in the class, but I hesitate as to whether they should be actually included therein, though, if so, I think that they should be regarded as at least constituting a very distinct sub-family, apart from the nocturnal genera, and thus I incline provisionally to arrange them.

Reptilia.

All that I have to notice, in this class, among the donations of the past month, consist of two specimens of *Testudo geometrica*, very young, which were packed with the

* *Caprimulgus, Ægotheles, Podargus, Steatornis, Nyctibius.*

other specimens received from Lieutenant Tickell ; and a small banded *Gymnodactylus*, from Afghanistan, nearly allied to a species formerly transmitted to the Society by Lieutenant Tickell from Midnapore, and for which we are indebted to Dr. Thomson. This I shall characterize when I come to notice certain others of the Gecko tribe, which I am now trying to collect.

Pisces.

For the only specimen of a Fish, the Society is under obligation to Dr. Spry, who has presented us with a small recent example of *Zygœna laticeps*, Cantor, ('Quarterly Journal of the Calcutta Medical and Physical Society,' for July, 1837, p. 316, and beautifully figured at p. 318) : it was taken in the Hooghly.

Mollusca.

The interesting series of Chusan Shells presented by Dr. Cantor to the Society, have already been enumerated in his letter, and accordingly need only here to be thus briefly mentioned.

Those presented by M. M. Liautaud and Reymoneng, consist of the following species, of which such as are marked with an asterisk, bear the names with which those gentlemen have favored me : in determining some of the others, I have received the kind assistance of Dr. Cantor :—

From Toulon,

* *Natica castanea.*

* *Helix variabilis.*

* *Pupa cinerea* (Mink ?)

* —— *maculata.*

* *Cyclostoma maculatum.*

From Algiers,

* *Bulimus decollatus*, Draparnaud.

From Teneriffe,

Caracolla pyramidalis.

From Acupulco, Mexico,

Fissurella —— ?

From Panama,

Bulimus —— ?

From Guayaquil, Equatorial America,

* *Bulimus depuna*, Sowerby (?)

From Monte Video,

Planorbis —— ?

From Lima,

* *Physa Peruviana*, Sowerby.

From the Sandwich Islands,

Bulla fasciata, Lamarque.

From Bone Bay, Ascension Island (of the Carolines),

Bulimus —— ?

From the Phillipines,

Bulimus gracilis, Lea, *Trans. Am. Phil. Soc.* (n. s.), VII. 458, and pl. XL, fig. 6; being the third or white variety described by that naturalist; Luçonia.

Helix gigantea : Luçonia.

H. polychroa, Sowerby, *P. Z. S.*, 1841, 87, subgenus *Cochlogena*, de F.; *Bulimus virido-striatus*, Lea, *loc. cit.*, *ante*, p. 456, and pl. XI. fig 2.

H. luteo-fasciata, Lea, Ibid. p. 462, and pl. XII. fig. 13, but of a less flattened form than is there represented: Puerto Galera.

Cyclostoma Woodianum, Lea, Ibid. p. 465, and pl. XII. fig. 1.

Mytilus —— ? (Brackish water.)

From J. G. Heatley, Esq., I have the pleasure to acknowledge the presentation of a large and interesting collection of Shells, chiefly marine, procured from both the Asiatic and Australian shores of the Indian Ocean. The number of species comprised in this collection is far too great for me to attempt a catalogue of them on the present occasion.

INSECTA.

A valuable box of Insects, collected in Afghanistan, and especially interesting from the attention which has been alike bestowed on all the orders, has been presented to the Society by Dr. Thomson. The general character of these, I may briefly remark, and as may be supposed, is European, with an admixture of tropical forms, analogous to those found on the Himalaya. A variety of British species occur, and among the very few *Lepidoptera* sent, are included the extensively distributed *Cynthia cardui*, little *Polyommatus Alexis verus*, which the Society also possess from Kumaon, *Hipparchia Megæra*, of which also we have a Kumaon example, other species of this group—one common in the vicinity of Calcutta, and a handsome white-bordered species allied to *H. Semele*,—a *Thecla*, which appears to be the European *Bœtica* figured by Boisduval, *Thestia Pirene*, *Sphinx convolvulus*, the domestic *Bombyx mori*, and five or six other species undetermined. The number of *Hymenoptera*, *Coleoptera*, *Orthoptera*, and even *Diptera*, as well as *Hemiptera*, is considerable; but I cannot at present do more than notice them thus generally and briefly.

Again congratulating the Society upon the extraordinary number of donations with which it has been lately favored, indicative of the rapidly increasing interest taken in its Museum, and which, it may readily be conceived, has found me pretty ample employment in determining so many species as have been enumerated, not to mention various others, it now only remains to subscribe myself,

Sir,

Your most obedient Servant,

EDWARD BLYTH.

Accompanying plate Figs. 1, 2, 3, Skull of undescribed *Bos*, from the Keddah Coast, in the London United Service Museum (vide p. 447); 4, occipital view of Gaour's Skull; 5, Horns of the Banteng, or Wild Ox of Java (p. 446); 6, Head of *Cervus niger*, Blainville, from one of the late Dr. Buchanan Hamilton's drawings.—E. B.

Museum of Economic Geology.

Read the following report of the Superintendent of the Museum of Economic Geology on a specimen of Limestone, from Darjeeling, referred to the Museum by Lieut. BROOMY, and his report on the Museum for April, 1842.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H. Torrens, Esq.

Secretary, Asiatic Society.

Sir,—I have to report upon the specimen of limestone from Darjeeling referred to the Museum by Lieutenant Broome, that it is a very pure stalagmitic limestone, containing ninety-eight per cent. of pure carbonate of lime, the remainder consisting of traces of iron, minute portions of silex, and some animal and vegetable matter, to which its colour is owing.

2. On a large scale, the produce may be somewhat less if it is found that fragments of other rocks are imbedded in it; ours having one or two small fragments of common serpentine; but this will make but little difference in its value as a useful limestone.

3. As this is so very pure, and differs so much from the kunkurs in appearance, and by the absence of silex and iron, I have called it a stalagmitic limestone. If found in a cave, it is possible the original rock may not be far off, and that organic remains will be found beneath the floor of the cavern: both should be carefully searched for.

I am, Sir,
Your obedt. servt.

Calcutta, 4th May, 1842.

H. Piddington,
Superintendent, Museum Economic Geology.

Report of the Superintendent of the Museum of Economic Geology for the month of April.

Museum Economic Geology.—We have nothing to report here for the present month, it being useless to undertake any arrangement when we should have to break it up again in the approaching removal of our cases to the rooms downstairs which are to be appropriated to them, and these must first undergo considerable repairs.

I have drawn up a Circular, explaining in a popular style the beneficial objects of the institution, with its wants, which our Secretary has sent to the Press, and I hope it will be ready to be submitted at our next meeting.

Geological and Mineralogical Departments.—We continue our arrangements here, and I am glad to report amongst them, that after a persevering search, the recovery of sixty-eight specimens out of seventy-seven, comprising the splendid and unique chronological series of Lavas from Vesuvius, from the Cabinet of the King of Naples, which was presented to the Society by our late President the Honorable Sir Edward Ryan. The catalogue of this series, with a translation, is in the hands of the Printers. In anticipation also of our now receiving Captain Herbert's catalogues from Mr. Batten, I have commenced arranging his series according to their numbers. I am also proceeding with the large Geological series mentioned in my last.

Museum Economic Geology.—The donations have been two bottles Sulphur water from the White Sulphur springs of Greenbriar County, Virginia, by the Agricultural Society.

A specimen of the best German Lithographic Stone, from Messrs. Ballin and Co.

Geological and Mineralogical.—A specimen of silicified wood from Van Diemen's Land; and

A stalagmitic ball from Chirra Poonjee, from F. Heatley, Esq.

H. Piddington,

30*th April*, 1842.

Superintendent, Museum Economic Geology.

For these Presentations and Contributions the thanks of the Society were accorded.